THE LEARNING STYLES OF NURSING STUDENTS AT A DISTANCE TEACHING UNIVERSITY

by

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submitted in fulfilment of the requirements for the degree of

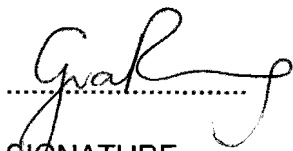## MASTER OF ARTS IN NURSING SCIENCE

at the

UNIVERSITY OF SOUTH AFRICA

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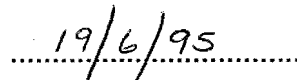JOINT SUPERVISOR: PROF H C PETRICK

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I declare that **THE LEARNING STYLES OF NURSING STUDENTS AT A DISTANCE TEACHING UNIVERSITY** is my own work and that all the sources that I have used or quoted have been indicated and acknowledged by means of complete references.

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SIGNATURE

(Mrs G H van Rensburg)

.... 19/6/95 ....
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SUMMARY

THE LEARNING STYLES OF NURSING STUDENTS AT A DISTANCE TEACHING UNIVERSITY

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Individuals have unique ways of perceiving and organising information, which are referred to as learning styles. By becoming informed about individual learning styles the educator is in a better position to support the learner in the learning process.

A descriptive correlational study was done to investigate the learning styles of nursing students at Unisa. In this research project a postal questionnaire was used to determine their learning styles. Research data were gathered on the demographic and academic profile of Unisa nursing students in order to determine their specific needs. Learning styles were correlated with various constructs (academic achievement, distance teaching, home language).

It was concluded that awareness of individual learning styles is important to assure quality improvement in nursing education. Both learner and educator need to be knowledgeable of learning styles and therefore a course in learning styles was designed.

KEY TERMS:

Academic achievement, Distance teaching, Experiential learning, Kolb model of experiential learning, Learning styles, Marshall and Merritt Learning Style Questionnaire, Motivation, Nursing students, Third year student, Unisa nursing students.

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To

ANDRE,

RUDI AND HEINRICH

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CHAPTER 1

THE INTRODUCTORY ORIENTATION TO THE STUDY

1.1   INTRODUCTION

The uniqueness of each student brings about individual differences and preferences in how the student perceives, thinks, solves problems, learns and relates to others (Ostrow 1986:149). These individual differences do not necessarily reflect the intellectual or special abilities of the student, but do probably influence the styles of thinking, which will in turn influence cognitive abilities. Some students may respond very quickly in certain situations, whereas other students, who are equally acquainted with the task at hand, may be more reflective and slower to respond (Woolfolk 1990:147-148). Therefore, two people sharing the same experience will make different choices about what data to process and what to ignore. These patterns of choosing are individual characteristics which are adopted as the individual's preferred learning style (Cleverly 1994:439; Kolb 1984:64).

A student's preferred learning style is a complex structure of characteristic modes of perceiving, remembering, thinking and problem-solving (Kolb 1984:64). When the learning styles of students are identified, the emphasis is on how the students learn and not on their intellectual abilities. To meet the heterogeneous needs of students provision must be made for individual patterns of learning. Adult education must thus make provision for differences in learning styles (Knowles 1980:56).

The foundation of a truly modern approach to education is the recognition of the uniqueness of the students. We can no longer afford to assume that all students learn the same way and through whichever strategy is being used (Dunn, DeBello, Brennan, Krimsky & Murrain 1981:372). Knowledge of the learning styles of students is important to eventually promote and maximise the success of the teaching-learning process.

1.2   ANALYSIS OF THE PROBLEM

During January 1990 at the "Eighth Annual Conference on Research in Nursing Education" in San Francisco, California, the need for further research on the learning styles of nursing students was raised in the opening speech "to further develop research into nursing students' learning style preferences" (Merritt 1990a:64).

To maximise students' potential for success, knowledge of their learning styles is important. Such knowledge could enable the lecturer to guide the student during this process and could enhance academic support and advising as well as curriculum development and teaching strategies (Highfield 1988:30).

All students should be given the opportunity to be taught in a way that considers their individual learning styles. These learning styles have a profound influence on their educational progress (Cleverly 1994:448). Recognition of individual strengths and weaknesses in their learning styles is important in order to provide the appropriate learning experiences to develop that individual.

Nursing education involves the teaching of adult learners, not only as students in the nursing environment, but also in terms of continuing adult education (Beukes 1990:61). Nursing requires both a concern for human service and scientific knowledge. Nursing students, as adult learners, must be assisted in the process of becoming competent practitioners with the necessary perspectives, skills and knowledge (Cranston & McCort 1985:136). Nurse educators are faced with new approaches to preparing students to function effectively in a challenging professional and practical environment (Laschinger 1992:105). They should be able to identify their students' preferred learning styles and support them in their individual ways of learning (Wells & Higgs 1990:389). In this way learning environments could be provided that foster the development of the competencies expected of nurse practitioners.

The University of South Africa (Unisa) is the leading South African distance teaching university. In many ways, Unisa can be seen as a pathfinder in distance education. It is

the only university in South Africa whose exclusive method of tuition is distance teaching (Unisa 1991). In many departments and fields of study, various surveys, projects, symposia, congresses and research projects are conducted, in which ways of upgrading education and teaching are reflected on.

At registration, the Unisa students receive information regarding general guidelines and instructions on how to approach the course, how to integrate the prescribed reading matter and tutorial letters with the study guide, and what is expected of them by certain dates. From the students are then expected to plan a study program according to their individual needs. However, it cannot be assumed that support of the students ends here. As the study year progresses, deficiencies and gaps in the learning process and inabilities to match learning styles and tutorial material may arise. Knowledge of these styles and processes are thus important in order to enable the lecturer to support the students to reach their highest possible level of academic achievement, either in the form of help by the lecturers themselves or by referring the students to a student support service.

The Unisa student does not receive traditional classroom teaching and is therefore seen as an independent learner (Smit 1988:41). Independent learners have their own learning styles, but these learning styles do not always suit the teaching styles used at Unisa. The question now arises whether one should not adapt teaching styles to student learning styles.

Knowledge and understanding of the independent learner is important in terms of differences in culture, personality, physical age, developmental level, experience, intellectual ability, academic progress, motivation and circumstances within the context of distance teaching.

Distance education is mainly based on home-based selfstudy. The distance teaching method does not necessarily fit the learning styles of all the students (Steyn 1992:64). Research has already shown that some methods are more effective than other methods in promoting academic achievement (Merritt 1990b:65). Yet, a student prefers a particular type of teaching method, when given a choice. If the teaching method, matches

the learning style of the student, that student will learn more quickly and retain the information longer. The opposite is also true. A mismatched situation will lead to serious underachievement and a noticeable failure to comprehend the principles underlying the subject matter (Allan & Jolley 1987:96).

Certain factors may influence learning and academic achievement. Examination results are important indicators of academic achievement although they do not give a complete picture of how well the learning processes have taken place (Fourie 1992:41). Examinations should test knowledge and understanding, and the ability to apply the knowledge. A student should never pass on merely the "regurgitation of 'swotted' facts" (Grässer 1988:29).

The content of the study material of the year is covered in the end of the year examination. Oosthuizen (1988:57) explains the end of the year examination as "a final conversation in a communication of a year". Compiling and marking of examination papers need a high level of seriousness, skill, and competence (Malan & Du Toit 1991:151). If the evaluation instrument, for instance the end of the year examination, is valid, reliable and objective, it is said that the examination results are valid and reliable (Fourie 1992:41; Malan & Du Toit 1991:161-162). (In chapter 4 academic achievement, examination as measure for academic achievement and factors influencing academic achievement, will be dealt with.)

Reasons why students want to complete a specific course may influence their motivation and interest in subjects. Motivation influences learning (Quinn 1988:72). Different factors motivate an adult learner. Internal factors that influence learning, and thus also academic achievement, are factors like promotion of job security, obtaining of acknowledgement and appraisal, selfactualisation and selfrealisation, and competitiveness (Quinn 1988:73-75). Sometimes the motivation for obtaining a qualification is merely a means to an end, namely a possible appointment or promotion to a certain post.

Many students tend to do the minimum amount of work in the shortest possible time. In the academic world this tendency is seen as a bad habit, but in the workplace high productivity, in other words completing the work in the shortest possible time, is generally

expected. Students are confused and do not develop good study habits. The tendency of some students to study sporadically, but intensively, can therefore often be attributed to difficult working conditions, a busy work schedule and lack of motivation.

Because adult learners probably have been out of touch with formal teaching situations for a considerable length of time, it might take longer to adapt to the learning situation again. Adult learners are serious learners. Specific occupational responsibilities, as well as the reason for and purpose of studying, play an important role in their decision to continue with their education. The adult learner has a need for self-direction which includes the deliberate making of decisions regarding where, when, what and how to learn. There is also no doubt that adults turn away from the traditional methods of teaching. Successful completion of a course is also important to the adult learner (Moletsane 1992:105-107).

The Department of Nursing Science at Unisa offers registered nurses the opportunity to further their studies through distance education. Nurses only qualify to register for the Unisa nursing course (BA(Cur) degree) after basic training in nursing at a nursing college or a university. Unisa nursing students can thus be described as adult learners with at least three years of tertiary education experience. (In chapter 3 the researcher discusses the Unisa nursing student comprehensively.)

The majority of Unisa nursing students hold full-time posts, often under difficult circumstances. Irregular and unsocial working hours (weekend and night duty) and unplanned overtime therefore influence the students' study programme. Other external factors like family and social responsibilities can also prevent students from reaching their study objectives.

For educators to analyse, motivate, evaluate and assist students in the teaching-learning process, the existence of individual differences must be supported. How students learn cannot be decided beforehand (Steyn 1994:37). Knowledge of the learning styles of the nursing students at Unisa, a distance teaching university, is thus important in order to promote and eventually maximise the success of the teaching-learning process.

1.3 STATEMENT OF THE PROBLEM

Unisa nursing students are qualified nurses and therefore differ from the traditional nursing students. Unisa nursing students are also different from most other Unisa students as they are all post-registration students (that is they already hold a qualification in nursing and also have working experience as nurses). They approach the Unisa learning experience as adult learners with previous learning experience.

Oosthuizen (1988:55) explains that the way in which tertiary education students associate with the learning material is extremely important. Within this context, the question of how tertiary education (adult) students learn, should be asked. Within the same context the question of how these students are taught and examined should also be asked. *What* must be taught can only be determined by first determining *how* a student learns, *how* a student is taught and *how* a student is evaluated. The choice and format of the learning material is therefore dependant on the answers to these questions.

Students have different learning styles, learning needs, learning levels and thought patterns. Provision for independent and unique learning should therefore be made as far as possible.

This study is of importance because no evidence of research into the learning styles of nurses in South Africa could be found.

The following research questions are formulated to direct the study:

- Who is the Unisa nursing student?

- What are the learning styles of Unisa nursing students?

- How does the learning style of the student affect academic achievement?

- How can Unisa nursing students be supported in reaching the highest level of academic achievement at a distance teaching university?

As this is a descriptive correlational study, no specific hypotheses are stated. The reasons for formulating research questions for this study are given in chapter 5, section 5.3.

1.4   AIMS OF THE INVESTIGATION

The aim of this research project is the identification of individual characteristics of the Unisa nursing students by describing these students and their individual learning styles. In order to achieve this aim relationships between learning styles, distance teaching, academic achievement and specific characteristics of Unisa nursing students will be determined. This research project therefore also encompasses a correlational component.

In the analysis of the research problem certain aspects are identified which could be important in the promotion of the teaching-learning process. The research project is therefore aimed at the following:

* to describe the Unisa nursing student;

* to determine the learning styles of Unisa nursing students;

* to classify these students according to the Kolb model of experiential learning;

* to determine whether there is a difference between how the students learn and how they would want to learn;

* to determine whether there is any relationship between the learning styles and the academic achievement of the students;

* to determine how distance teaching relates to the learning styles of Unisa nursing students;

The above aspects were classified into four important categories, namely:

- the Unisa nursing student;

- the learning styles of the Unisa nursing student;

- learning styles and distance teaching; and

- learning styles and academic achievement.

During the course of this research project, attention will be given to all four of the above aspects.

1.5   DEMARCATION OF THE FIELD OF INVESTIGATION

The third year students were used as the target population, because it is accepted that these students already have stable learning styles. The decision was made on the following grounds:

- It is expected that third year students will perform better than first and second year students. The reasons for this assumption are that these students have already proven themselves by passing the first and second year; third year students are students with ample learning experience in study methods, preparing and writing assignments and examinations to draw on; they have chosen certain major subjects, which most probably means they have an interest in those subjects; and motivation usually reaches a peak in the third year (Weyers 1988:15).

- The third year level courses mostly consist of three papers and therefore it is expected that the extent of the study field and study material is wide. The student is thus evaluated on a more comprehensive level of knowledge.

1.6   EXPLANATION OF CONCEPTS

The following explanations of concepts are provided to clarify terminology which is used in the research project.

1.6.1   Cognitive and learning styles

The terms *cognitive styles* and *learning styles* are often used as equivalents, and are then referred to as *learning styles.* Some researchers do however distinguish between these two terms. The researcher does not distinguish between cognitive and learning styles and uses the term learning style.

Learning style is a comprehensive term, referring to the internal organisation and perception of information, as well as external factors influencing learning. (A discussion on this matter is given in chapter 2, section 2.2.1.)

1.6.2   The Kolb model of experiential learning

The *Kolb model of experiential learning* is a four-stage cycle involving four modes of learning on two bipolar dimensions. The cycle requires four different kinds of abilities which are concrete experience, reflective observation, abstract conceptualisation and active experimentation. Abstract conceptualisation is the polar opposite of concrete experience and active experimentation is the polar opposite of reflective observation (Kolb 1984:40-41). (In chapter 2, sections 2.6 and 2.7 experiential learning and the Kolb model of experiential learning are discussed.)

1.6.3   Third year student

For the purpose of this study a *third year student* is a student who is registered for a third year subject in the Department of Nursing Science. (Refer to chapter 4, section 4.6 in this regard.)

1.6.4   Academic achievement

The *academic achievement* of the target group used in this research project, is described by using their end of the year examination results obtained in the third year level course within the Department of Nursing Science.

1.6.5   Learning and studying

For the purpose of this research project no differentiation will be made between *learning* and *studying*, as both these terms can be used when referring to the competency in obtaining knowledge. (Refer to chapter 4, section 4.5 in this regard.)

1.7   EXTENT AND LIMITATIONS

For the purpose of this research project, the subjects on the same year level within the Department of Nursing Science, are considered to be equivalent. Third year level Nursing Education is for instance not easier or more difficult than third year level Nursing Administration. Different subjects which are compulsory for the Unisa nursing course (BA(Cur) degree course) are also considered to be equivalent. A mark obtained in a certain subject, is equivalent to the same mark obtained in any other subject on the same year level within the BA(Cur) course. First year level Sociology is for instance not easier or more difficult than first year level Community Health Nursing Science.

The pass mark required for all subjects at Unisa is uniform, namely 50 percent. Only marks obtained in third year subjects within the Unisa nursing course will be used in this research project.

Academic achievement is referred to as the percentage obtained by the student in a particular course. It does not necessarily have the meaning of good or weak performance.

Academic achievement is not always a reliable reproduction of the intellectual abilities of the student. When determining the learning style of a student, the emphasis is on how the student learns, rather than on the intellectual abilities of that student. The researcher therefore presumes that the learning styles of students may affect their academic achievement.

1.8 OUTLINE OF THE STUDY

The outline of the study is as follows:

CHAPTER 1 The introductory orientation, problem statement, purpose of the study and concept statement.

CHAPTER 2 The review of literature on other research on learning styles and research related to this study as well as a discussion of the Kolb model of experiential learning.

CHAPTER 3 The review of literature on the nursing student, with special reference to the Unisa nursing student.

CHAPTER 4   The review of literature on academic achievement, examination as measure for academic achievement, motivation and learning, with special reference to the third year student.

CHAPTER 5   The design of the empirical study, including the type of the study, research method, research population, research instrument, data collection, response and method of data analysis.

CHAPTER 6   The analysis of the data describing the Unisa nursing student.

CHAPTER 7   The analysis of the data describing the learning styles of Unisa nursing students and the correlation of learning styles with academic achievement, distance teaching and home language, as well as distance teaching and the perception of the Unisa nursing course.

CHAPTER 8   The summary of the findings, conclusions, recommendations and limitations, including guidelines for support to Unisa nursing students.

1.9   CONCLUSION

Each individual has a unique way of perceiving and organising information, which is referred to as learning style. In adult education provision must be made for the specific needs of individual students.

Unisa offers nursing students the opportunity to further their education through distance teaching. This method of tuition does not necessarily fit the learning styles of all the students. There is a need to improve our teaching techniques in order to help students maximise their potential and reach the highest possible level of academic achievement which they are capable of. In order to do this, we need to address the discrepancy between individual learning styles and our teaching programmes. By becoming informed about individual learning styles we will be in a better position to accommodate individual

learning styles within our courses and adapt our teaching material and programmes accordingly. This is necessary in order to support our students in the learning process.

In the following three chapters a review of the literature will be given and past studies will be discussed.

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CHAPTER 2

LEARNING STYLES AND THE KOLB MODEL OF EXPERIENTIAL LEARNING

2.1 INTRODUCTION

In the health care field, including the nursing field, learning must be maximised to assure competent practitioners. Because of its major practical component, as well as continuous innovation as a result of maintained and contemporary changes, nursing requires both a concern for caring for others as well as the scientific knowledge within a specialised form of education and training (Cranston & McCort 1985:136; Laschinger 1992:114; Searle & Pera 1992:77, 87).

Innovation in nursing education supports the contention that we are in an era of designing programs and curricula which fit the learners and their learning styles. Walker, Merryman and Staszkiewicz (1984:27) refers to the changes as "learning style based education". Research into learning styles and the effect they may have on academic achievement, is of relevance if one adopts the belief that students know how to learn, how to explain themselves, and how to develop skills and knowledge. Ways of structuring the educational environment should thus be found to maximise learning and academic achievement.

Many research projects on the learning styles of nursing students have been conducted in other countries. As a result of these research projects the learning environments and learning material was changed to enhance the learning process and academic achievement. The researchers in this field suggested that more research on this topic was necessary however (Brink 1988:11; Davis 1990:406; Duff, Johnston & Laschinger 1992:233; Laschinger 1986:293; Miller, Alway & McKinley 1987:399; Mumford 1986:7; Wells & Higgs 1990:390).

In this chapter the researcher will look into research projects which have been launched to study the learning styles of nursing students. Certain aspects will also be clarified on the basis of literature and previous research. Local as well as international research done on learning styles, is discussed. The process of experiential learning as well as the model within which this research project was conducted, will also be explained.

2.2   THE CONCEPT OF LEARNING STYLES

The learning process is a complex interaction of processes with distinctive individual patterns. These patterns are called learning styles (Kolb 1984:61-62). Learning styles can also be explained as individualised ways of going about getting knowledge (Chickering 1981:102). A number of different definitions of learning styles exist. Some of the researchers make a distinction between learning styles and cognitive styles.

Merritt (1990a:64) defines learning style as the way learners prefer to engage and participate in learning. The emphasis is put on how a person prefers to learn.

Laschinger and Boss (1984:375) define learning style as the way in which an individual organises information and experience.

Moelwyn-Hughes and Sayed (1993:14) quote Ford's definition of learning styles as "the particular way that an individual approaches a learning task, on one occasion". They also maintain that "a tendency to use one type of strategy constantly is a learning style".

According to Miller et al. (1987:399) learning styles are more than just study skills. They define learning styles as fairly stable, consistent approaches to learning across a variety of learning activities.

Davis (1990:407) states that learning styles are "derived from a variety of previous learning experiences,... which can be modified with suitable interventions and guidance by the teachers".

Engelbrecht (1986:5-7) classifies learning styles as cognitive factors. She defines cognitive style as the way or style in which a pupil perceives, learns, thinks or observes. It is not clear whether she differentiates between cognitive and learning styles.

Talarczyk (1989:265) uses the term cognitive style and quotes Messick's definition of cognitive style as being consistent, individual differences in ways of organising and processing information and experience.

Blagg (1985:90) explains cognitive style as the characteristic spontaneous manner in which an individual conceptually organises the environment and learning style as the preferred learning mode of students.

Cranston and McCort (1985:136) suggest that there is a slight difference between cognitive and learning styles. Cognitive style is defined as the preferred way of receiving information or gaining meaning from the environment. Learning style, on the other hand, is defined as a student's attitude towards learning, teachers, teaching method and peer relationships.

Differentiating between cognitive and learning styles, Woolfolk (1990:147) defines cognitive styles as "different ways of perceiving and organising information" and learning styles as "individual differences that affect classroom learning". Cognitive styles are described as something falling between mental abilities and personality traits. Because they are styles of *thinking*, they influence cognitive ability and are influenced by cognitive ability. Social relationships and personal qualities are also affected by these preferred ways of dealing with the world. Different individuals have different styles for processing and organising information and for responding to environmental stimuli. Learning styles

on the other hand, include preferences for where, when, with whom or with what (lighting, food or music) you like to study (Woolfolk 1990:151).

From the above definitions it can be accepted that learning style is the way in which an individual perceives or observes information and previous experiences, processes and organises it to gain meaning.

Different views on whether learning styles can be changed or modified also exist. Davis (1990:406) says that students can acquire or modify learning styles, whereas Miller et al. (1987:399) define learning styles as "approaches to learning which are fairly stable and consistent". In his research study on learning styles, Fransman (1991:73) claims that, once a learning style has been adopted by an individual, that learning style generally perpetuates in tertiary education. Modification of the acquired learning style can only be in favour of a more meaningful learning style. Like Kolb (1984:64), Honey and Mumford (Moelwyn-Hughes & Sayed 1993:14) accept that people develop preferences for different learning styles in the same way that they develop any other kind of style.

2.3   KOLB MODEL OF EXPERIENTIAL LEARNING

The Kolb model of experiential learning is described by Baker, Wallace, Bryans and Klapthor (1985:1496) as an "elegantly simple Experiential Learning Model". It is also seen as an exceptionally easy model for self-test. It has been praised for its "dynamic properties" and therefore been used in numerous studies and corporate research and development. Some South African tertiary educational institutions also support the Kolb model of experiential learning strongly (Welman & Huysamen 1994:258).

2.3.1 Experiential learning

The essence of experiential learning is concerned with how experience is transformed into ideas which again can be used to select and integrate new experiences. Miles (Allan & Jolley 1987:85) defines it as follows:

> *Experiential learning occurs when a person engages in some activity, looks back at the activity critically, abstracts some useful insight from the analysis and puts the result to work.*

The sequence of these experiences and learning actions forms a learning cycle. Experiences can be defined as any activities which generate information and which do not necessarily take place in a classroom. This is particularly important in the case of nursing students where the students hold a post in the clinical field where opportunities to gain information abound. The student experiences several situations which form part of the learning cycle (Kolb 1984:38).

2.3.2 Kolb's experiential learning cycle

Kolb (1984:6) describes a learning theory which explains how it is that people generate from their experiences the concepts, rules and principles that act as guidelines in situations and how concepts are modified to improve their effectiveness. He stresses the fact that people learn from their previous experiences. There are two reasons why learning is called an experience: firstly it has an intellectual origin and secondly it emphasizes the central role that experience plays in the learning process (Kolb 1984:20).

The Kolb model of experiential learning is based on work done by Dewey, Lewin and Piaget, who have been described as the foremost intellectual ancestors of experiential learning (Kolb 1984:15).

Kolb (1984:40-41) describes the process of experiential learning as a four-stage cycle involving four adaptive learning modes, namely concrete experience, reflective observation, abstract conceptualisation and active experimentation (see **Figure 2.1**). The cycle represents two bipolar dimensions. Concrete experience and abstract conceptualisation are represented as two dialectically opposed adaptive orientations. Active experimentation and reflective observation are another two dialectically opposed adaptive orientations. The structural bases of the learning process lie in the transactions of experiences among these four modes and the way in which these experiences are resolved. Therefore, learning is the process whereby knowledge is created through the transformation of experience. To enable these experiences to generate knowledge, it is important that the experiential learning cycle must be completed.

Kolb (1984:132) explains the experiential learning cycle as a spiral, and not as a circle. This means that each episode of experience has the potential for movement from prior doing to a life of choice and purpose. The learning cycle thus brings about development. For learning to be effective the learner has to move through the cycle of experiences (see **Figure 2.1**), which are:

- concrete experience, which is followed by

- observation and reflection, which leads to

- the formation of abstract concepts and generalisations, which lead to

- hypotheses to be tested in future action (Kolb 1984:68).

The hypotheses will then again lead to new experiences (Hodges 1988b:341).

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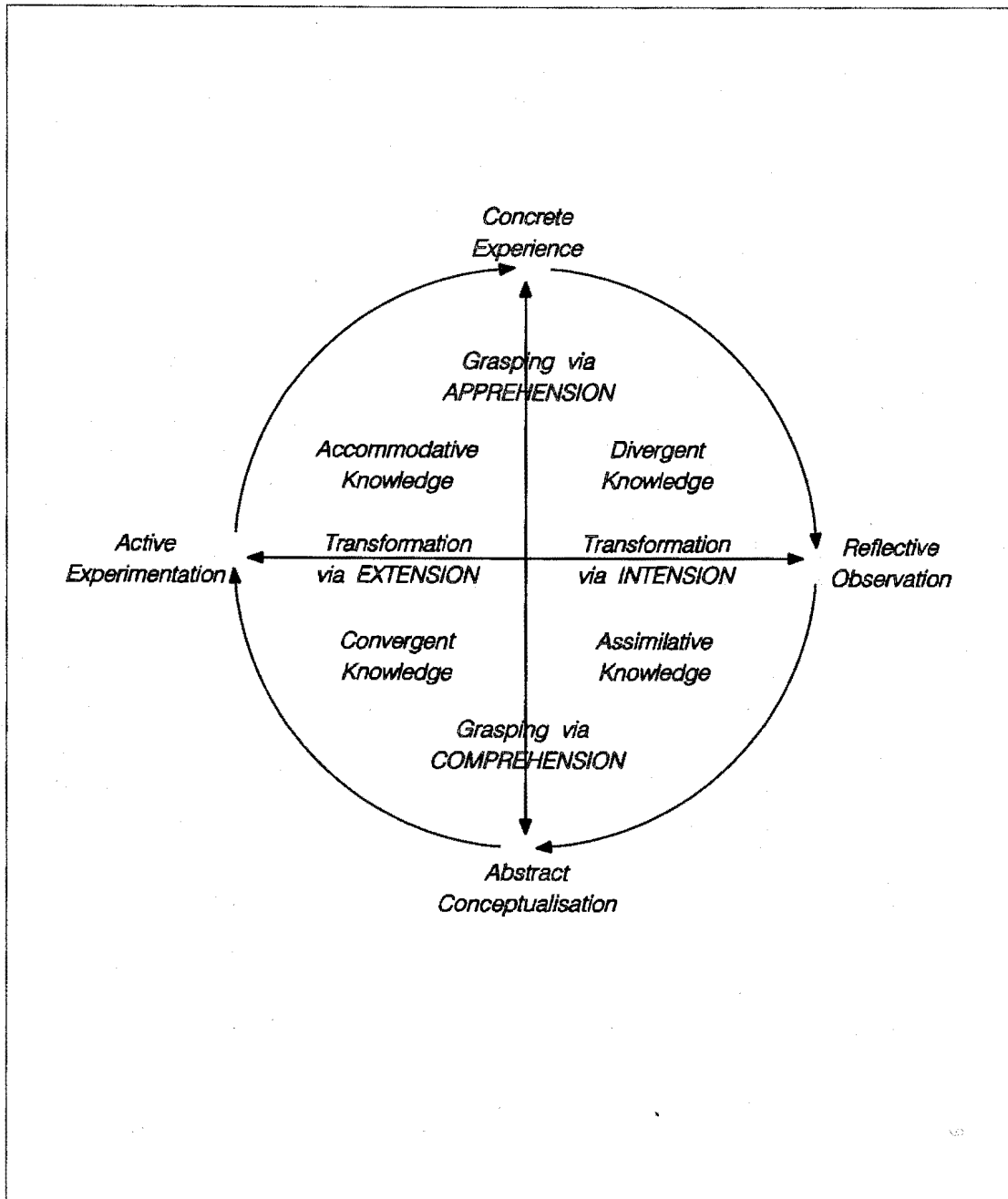
Figure 2. 1 Kolb model of experiential learning (Kolb 1984:42)

The experiential learning cycle includes the following steps, namely:

- Experiencing. When activities generate knowledge, the experiences have the potential for learning. These experiences can be used in the inductive learning process.

- Sharing perceptions from experience. Sharing and verbalising what one saw or felt during an activity broadens and deepens the experience.

- Making sense of the experience. During this step one clarifies and interprets what the meaning of the experience is. It can be seen as the key step in which a systematic examination of the experience is done. Uses for the generated information may also be realised or identified.

- Abstracting concepts, generalisations and principles. During this stage certain experiences can be selected and applied to reality.

- Applying concepts, generalisations and principles. The learner now has to implement the selected experiences and apply them to future activities. Individual goals and specific action plans may enhance this process (Kolb 1984:68-69).

The four different kinds of adaptive abilities which are required by the four-stage cycle, are:

2.3.2.1 Concrete experience (CE)

This orientation emphasises feeling as opposed to thinking. It focuses on being involved in human situations in a personal way. The uniqueness and complexity of present reality is of concern as opposed to theories and generalisations. People with concrete experience orientation are often good intuitive decision makers, function well in unstructured situations, enjoy others and are good at relating to others. They have an open-minded approach, value interpersonal relations and prefer being involved in real situations (Kolb 1984:68).

2.3.2.2 Reflective observation (RO)

This orientation emphasises understanding as opposed to practical application. It focuses on understanding the meaning of ideas and situations. Careful observation of what is true and how things happen, is important. People with a reflective orientation look at things from different perspectives and appreciate different points of view. They form their own opinions by relying on their own feelings and thoughts (Kolb 1984:68).

2.3.2.3 Abstract conceptualisation (AC)

This orientation emphasises thinking as opposed to feeling. It focuses on using ideas and concepts which are logical. A scientific approach to building general theories, is important. People with an abstract conceptualisation orientation are good at quantitative analysis, systematic planning and manipulation of abstract symbols. They value precision, the discipline of analysing ideas and the aesthetic quality of a neat conceptual system (Kolb 1984:69).

2.3.2.4 Active experimentation (AE)

This orientation emphasises practical application as opposed to reflective understanding. It focuses on changing situations and actively influencing others. Doing rather than observing and a pragmatic concern with what works, is important. People with an active experimentation orientation are good at getting things done, although it might mean taking some risks in order to achieve a goal. They like to see results around them which have an influence on the environment (Kolb 1984:69).

Four different elementary forms of knowing, namely convergence, divergence, assimilation and accommodation are derived from the two bipolar dimensions formed by the opposing orientations, abstract-concrete (AC-CE) and active-reflective (AE-RO) (Kolb 1984:76).

2.3.3 Kolb's four learning styles

Learning is a cyclic and lifelong process of adaptation by the learner in a changing environment. Through the complex structure of learning, the individual is allowed to develop individual and unique processing structures or learning styles. According to Kolb (1984:76) the individual style of learning is the underlying structure of the learning process. Most people develop individual styles of learning that emphasis some learning abilities over others. Kolb (1984:95) describes learning styles as adaptive orientations that achieve stability through consistent patterns of transaction with the world. He (Kolb 1984:97-98) explains it in this way:

> ...*my active orientation helps me perform well in active tasks, and since I am rewarded for this performance, I choose more active tasks, which further improves my active skills...*

Kolb (1984:77) describes four basic learning styles in his model of experiential learning.

2.3.3.1 *The convergent learning style*

This learning style relies on the dominant learning abilities of abstract conceptualisation and active experimentation. Problem-solving, decision-making and the practical application of ideas are great strengths of this style. The converger does best in situations where there is a single correct answer or solution to a question or problem. Convergers organise their knowledge in such a way that it can be focused on specific problems through hypothetical-deductive reasoning. They prefer to deal with technical tasks and problems, rather than social and interpersonal issues. They are people who are controlled in their expression of emotion (Kolb 1984:77).

2.3.3.2 The divergent learning style

These learners have the opposite strengths from convergents. Concrete experience and reflective observation are the divergers' dominant learning abilities. Their imaginative abilities and awareness of meaning and values, are their great strengths. Their adaptive ability is to view concrete situations from many perspectives and then organise the many relationships into a meaningful *gestalt.* They therefore adapt rather by observation than action. The diverger performs better in situations where alternative ideas and implications are generated, such as group discussions and brainstorming sessions. The diverger is also interested in people and tends to be creative and emotion-orientated (Kolb 1984:77-78).

2.3.3.3 The assimilative learning style

The dominant abilities of these learners are abstract conceptualisation and reflective observation. Assimilators' greatest strength lies in their ability to reason inductively and create theoretical models. They can also assimilate disparate observations into an integrated explanation. Assimilators, like convergers, are less focused on people and more concerned with ideas and abstract concepts. Their concern with ideas is more because of their logically soundness and preciseness, than because of their practical value (Kolb 1984:78).

2.3.3.4 The accommodative learning style

These learners have the opposite strengths from assimilators. Accommodators emphasise concrete experience and active experimentation. Doing things, carrying out tasks and plans and getting involved in new experiences, are their greatest strengths. The adaptive emphasis of this group is seeking opportunities and taking action and risks. Situations where one must adapt oneself to changing immediate circumstances, are best suited to the accommodators. Theory or plans that do not fit the facts, will most likely be discarded by this group of learners. Assimilators, the group with the opposite learning style, are more likely to disregard or reexamine the facts. Problem-solving will be

approached in an intuitive trial-and-error manner, while relying on others for information, rather than on their own analytical ability. Although accommodators are seen as persons who are at ease with people, they can be seen as impatient and bold or aggressive (Kolb 1984:78).

By introducing or supporting preferred ways of learning, the learning process can be promoted. Kolb (1984:7) is however concerned about the attitude of educators who are more concerned about *what* students learn than *how* students learn.

2.3.4 Kolb's learning style inventory

The Kolb Learning Style Inventory was created to assess individual orientation towards learning. This Learning Style Inventory measures a person's relative emphasis on each of the four modes of the learning process, which are concrete experience, reflective observation, abstract conceptualisation and active experimentation. It also measures two combination scores that indicate the extent to which the person emphasizes abstractness over concreteness, as well as the extent to which that person emphasizes action over reflection (Kolb 1984:67-68).

Different views on the construct validity and reliability of the Kolb Learning Style Inventory have been discussed in the literature. Marshall and Merritt (1986:257) as well as Honey and Mumford (Moelwyn-Hughes & Sayed 1993:14) developed new learning style questionnaires in reaction to criticism of the construct validity of the Kolb Learning Style Inventory.

In their research on the academic success of students in different study directions Welman and Huysamen (1994:263) made use of the Kolb Learning Style Inventory. The construct validity and reliability of this instrument was tested. According to their study the Kolb model of experiential learning had some weaknesses and the Learning Style Inventory lacked construct validity and reliability. They did however not reject the Kolb

model of experiential learning but suggested that a new learning style questionnaire, based on the Kolb model of experiential learning, could be designed.

In another research project undertaken by Moelwyn-Hughes and Sayed (1993:17), the findings showed that the Kolb Learning Style Inventory lacked construct validity and reliability. They have also therefore abandoned the use of this instrument.

Major criticism on the Kolb Learning Style Inventory seem to have been ignored although specific studies which were undertaken to investigate the measurement properties of this instrument have shown serious instrument weaknesses. In spite of numerous charges against the Learning Style Inventory, it is the most frequently used method of measuring learning styles among nursing students (DeCoux 1990:202; Moelwyn-Hughes & Sayed 1993:15).

On the other hand Baker et al. (1985:1495) stated that the Kolb Learning Style Inventory is the only instrument for which a match between factors and learning styles exists. This conclusion was made after the instrument, together with other instruments were studied in a comparative analysis to find some common conceptualisation of learning styles.

2.4   OTHER MODELS OF LEARNING STYLES

A number of different models of learning styles exist. Some of these models will be discussed briefly.

2.4.1   Field-dependence and field-independence learning style model

After observing airline pilots, Witkin (Brink 1988:11) identified the learning styles of field-dependence and field-independence. This research tested people's ability to distinguish between the significant and the contextual. A bipolar learning style was identified. The

one pole was dominated by the organisation of the field or parts of the field as integrated or merged. On the other pole parts of the field are experienced as discrete from the organised background. These styles refer to ways in which individuals perceive and order the world around them (Brink 1988:11; Cleverly 1994:440; Garity 1985:12).

In the interaction with fellow human-beings, field-dependent and field-independent individuals differ. The field-dependent individual experiences or perceives a pattern of the world around them as a whole. They find it difficult to focus on one particular aspect of a situation and there is relative inability to perceive parts of a field as discrete. They are better at learning material with social content due to their interpersonal orientation. They are attentive to social cues, feelings, close emotional and physical contact and social relationships. External referents and reinforcement by externally defined goals, are more likely to motivate the field-dependent individual. The field-dependent individual is also more affected by criticism and takes on a more passive spectator role. The field-independent individual perceives a total pattern in separate parts and is able to analyse a pattern and identify its components. The field-independent individual is inclined to maintain a social distance, is more individualistic and is described as a cold person with an impersonal orientation. Their frames of reference are more internalized and are therefore more self-directed. When solving problems, the field-independent individual is better at analysing complex, unstructured material and then organising it to solve the problem. Field-dependent learners are more concerned with ideas than people. They also prefer active participant roles and readily test out their ideas or opinions in the group (Brink 1988:11-12; Cleverly 1994:441; Garity 1985:13; Ostrow 1986:149; Partridge 1983:244; Quinn 1988:106; Woolfolk 1990:148-149).

Regarding the teaching approaches, the field-dependent and field-independent individuals also differ. The field-dependent individual needs structured material, clear instructions on how to solve problems and are dependent on cues for learning. They respond best to teaching methods where there is a shared responsibility between teacher and learner and are influenced by verbal as well as non-verbal feedback. The discussion method is usually the preferred method of teaching. On the other hand, the field-independent individual prefers to use hypothesis-testing approaches to problem-solving and therefore the lecture method. They prefer to define their own objectives and do not

need structure or cues. The field-independent individuals can break down material and reorganise it. Where material contains social information, they may need assistance, whereas they are good at learning material with natural science content. The field-independent nurse is often found in surgical nursing whereas the field-dependent nurse is likely to work in psychiatric nursing (Brink 1988:11-12; Cleverly 1994:441; Garity 1985:13; Ostrow 1986:149; Partridge 1983:244; Quinn 1988:106; Woolfolk 1990:148-149).

In a research project on whether learning style predicts differential success in nursing courses, Talarczyk (1989:268) came to the conclusion that there is no significant correlation between field-dependent and field-independent learning styles and overall academic achievement of senior nurses. They used the field-dependence-independence model, because it is one of the most extensively researched learning style models (Talarczyk 1989:265).

2.4.2 Reflective and impulsive learning styles

It was observed that individuals had different conceptual tempos when confronted with problems to solve. Reflective and impulsive styles of reactions were identified. These styles refer to the way in which an individual responds to something like a question.

Students with impulsive styles come up with an answer to a problem quickly and report the first choice that occurs to them. The response is often inaccurate. These students usually finish their multiple-choice questions in no time and often need to be given specific strategies for checking their work (Cleverly 1994:442; Quinn 1988:106; Woolfolk 1990:150).

Students with reflective styles are usually slow and careful responders but tend to answer correctly. They take time to review and analyse possible strategies before responding. The reflective student is less likely to fail, although intelligence cannot be related to these

two different styles. The mere fact of being more careful when answering slower, may be more effective (Cleverly 1994:442; Quinn 1988:106; Woolfolk 1990:150).

2.4.3 Honey and Mumford learning style model

The Honey and Mumford model identifies four basic learning styles, namely the activist, reflector, theorist and pragmatist. They may occur in variable combinations but each individual develops a preference for one of these styles (Moelwyn-Hughes & Sayed 1993:15; Mumford 1986:7-8).

Research done by Honey and Mumford was in the field of management education. The objective was to promote effective learning by the understanding and use of individual learning styles. According to these researchers learning styles are part of the total learning context, and are influenced by the environment in which learning takes place. Their work, as well as their questionnaire, the Honey and Mumford Learning Style Questionnaire, was based on Kolb's theory of experiential learning (Moelwyn-Hughes & Sayed 1993:14; Mumford 1986:7).

In their research Honey and Mumford encountered problems with the procedure and face validity of the Learning Style Inventory designed and used by Kolb (Moelwyn-Hughes & Sayed 1993:15; Welman 1993:263). According to them the instrument lacks construct validity and therefore they have abandoned its use. The Kolb Learning Style Inventory is based on only 36 words and not on sentences. These words also do not describe management activities, the field in which their research was done.

Honey and Mumford's Learning Style Questionnaire differs from the Kolb Learning Style Inventory in two ways. They base their 80 items on recognisable statements of managerial behaviour of which the answers scored are a starting and not a finishing point. Their preference is to focus on observable behaviour rather than on the psychological basis for behaviour (Moelwyn-Hughes & Sayed 1993:15; Mumford 1986:7).

The Honey and Mumford Learning Style Questionnaire has a total of 20 items for each of the four learning styles. Respondents are asked to indicate whether they agree or disagree with each item. A five-point Likert scale is used for each item which avoids options like *do not understand* or *unsure*. They maintain that the majority of the items are concerned with behavioural nature and include general trends in an individual's behaviour (Moelwyn-Hughes & Sayed 1993:15-16).

The aim of Honey and Mumford's research was to give practical guidance to learners to develop their abilities, and to the teachers who are trying to help them (Moelwyn-Hughes & Sayed 1993:15).

In their article Moelwyn-Hughes and Sayed (1993:17) criticised Honey and Mumford's Learning Style Questionnaire by saying that it is too management-bound to be of assistance in higher-education. They were also not convinced beyond question that the instrument was valid and reliable enough to be related to students' approaches to learning. As a result, they have decided to discontinue working with the instrument.

2.4.4 Dunn learning style model

Dunn (1987:44) explains learning styles in terms of individual student reactions to 23 elements of instructional environments including the immediate environment (temperature, noise level, lighting), emotional involvement (motivational strategies, level of responsibility and structure), social support (working alone or with others, with the teacher's direction or not), physical characteristics (time of day, visual versus auditory or tactile materials), and psychological inclinations (impulsive or reflective, global or analytic). According to the Dunn model, learning may not occur unless the environment, resources and/or instructional approaches respond to the individuals characteristic learning styles. Dunn (1987:48) also suggests that an instructional model with the correct combination of elements, will influence student achievement. The Dunn model is much used in research on the environmental elements of learning styles. On the basis of studies described by Dunn (1987:50), she indicates that it is likely for students to improve their academic achievement if they respond well to their environments.

2.5 CULTURE AND LEARNING STYLES

Culture is defined as the total shared way of life of a group of people, which includes their modes of thinking, acting and feeling (which are expressed in religion, law, language, art, custom) (Luthuli, Masiea & Zuma 1992:32).

According to Reilly and Oermann (1992:39) cultural determinants denote the structure of knowledge, its meaning and relationships and the process by which a certain cultural group learns. Therefore, culture influences learning. Machet (1991:94) maintains that language influences the way in which text is understood. Language also depends on social and cultural factors. An individual's cultural framework will also play a role in the recalling of text. Culture therefore influences the way in which information is understood, interpreted and recalled (Machet 1991:94).

People of different cultural groups learn to learn differently which will also influence responses to learning situations. Certain cultures promote active participation in the learning process more than just the skill of memory or rote learning. Cultural differences will therefore have an effect on the meaning of learning and learning styles from childhood and may become a very significant part of the framework of the learning concept (Reilly and Oermann 1992:39; Van Heerden 1993:66). Van Heerden (1993:66) also suggests that academic achievement is influenced by culture.

In an article written by three post-basic students on the hurdles that black students face in (nursing) education, the writers expressed their doubts as to whether black students adapt well enough to the western model of learning and education. Due to the cultural background and traditional practices of education they claim that the black student is not always prepared for the western model. The medium of instruction, which is a foreign language, is also highlighted as a problem, as it makes the learning process time-consuming (Luthuli et al. 1992:30, 32). These writers also described the effects of the early *Bantu* education and explained why the black student is not prepared for the model used in the western colleges and universities. According to them, the new nursing student has to adapt to the sub-culture of nursing and the professional role which

accompanies it, while she still has to overcome the differences in the learning models. The authors also repeatedly referred to the examination results of the black students being consistently poor compared with those of other races. These statements were not underlined by other literature or any statistics or research results (Luthuli et al. 1992:30-33).

In a research project undertaken for a doctoral thesis, Van Heerden (1993:24-25) identified factors which appeared to influence the studies and academic achievement of Black students at Unisa. She referred to the statistics given by the Bureau for Management Information in 1992, when she said that Black students are the weakest achievers in comparison to the students from other population groups. She came to the conclusion that two categories of factors influenced the academic achievement of the students: socio-cultural (external) factors and individual (internal) factors. These factors are interrelated and influence each other. External factors, originating from circumstances before registration, include unsatisfactory school education, learning styles and study methods, political and economical factors, physical environment, language, individual characteristics and ideas and norms. Not all these factors play a negative role, but sometimes motivate the student to reach higher success. The quality of the school education which is often influenced by political factors, has a definite effect on the learning style of a student. Learning styles are further influenced by language, study material, background knowledge as well as traditional ways of thinking. Internal factors like motivation, also contribute to the level of achievement (Van Heerden 1993:66-67).

Kolb (1984:67) refers to various researchers when saying that cultural experiences play a major role in cognitive functioning. People's styles of thinking, differences in global or abstract functioning and the rate and direction of cognitive development, are influenced by one's cultural group. The diversity and complexity of cognitive processes influences the individual styles of learning (Kolb 1984:66).

Learner characteristics such as cultural heritage should thus be assessed because of the impact they may have on the learning process. Not much research has been done on the effect of culture on the learning styles of students.

2.6   REVIEW OF RESEARCH ON LEARNING STYLES

The review of the related literature was undertaken to determine the relevance and importance of research into learning styles.

Research into the learning styles of students makes the students aware that others may learn differently than they do, and that understanding this can help them communicate better. It enables them to self-select training situations that are most productive for them. It also helps them to understand how their learning styles underlie their approaches to problem solving. They will understand how and why they learn. As a result they will have knowledge which will be profitable to work-related situations. It is said that students who know their learning style enjoy their studies, study longer and harder and get higher grades than students who plug along (Nelson 1979:38).

Students learn more and better if they study in their preferred setting and manner. The younger student might not be the best judge of how she is supposed to study (Bitzer & Venter 1992:18; Ostmoe, Van Hoozer, Scheffel & Crowell 1984:27-29). It is, however, not always possible to accommodate all the learning styles of all the students. It also does not mean that a preferred learning style is always the most effective one. Trying to accommodate a student to study in a preferred manner does not mean that there will be major changes in her achievements, because other factors than preferred learning styles also affect a student's learning (Wells & Higgs 1990:385).

Knowledge of the learning styles of their students, helps the lecturers to be more flexible in instructional procedures (Baker et al. 1985:1496). The objectives of the teaching-learning process not only force the lecturer to consider what has to be learned, but also the way in which the student learns. Kotzè (1988:196) quotes Leino by saying that "the teacher should adjust his teaching in terms of the learner". Some researchers feel that it is a major educational objective to teach students how to learn as well as how to use various learning styles (Miller et al. 1987:399). Because the student is one of the most central figures in the teaching-learning process, it is of utmost importance that the lecturer makes sure that the activity takes place as effectively as possible.

Again Kotzè (1988:196) quotes Leino in this regard:

every student is

> *-like all other students in some ways,*

> *-like some students in some ways, and*

> *-like no students in some ways.*

As a result of various factors like hereditary equipment, particular past life experiences and the demand of our present environment, most people develop learning styles that emphasise some learning abilities over others (Kolb 1984:76). A learning style therefore will have some weak and some strong points. According to Main (Moelwyn-Hughes and Sayed 1993:15) an individual develops a combination of skills, attitudes and approaches to learning. The student/learner with knowledge of these will build on his strengths.

The question arises whether learning material which is poorly structured, not 'user friendly' or well organised, will have an effect on academic achievement. Miller et al. (1987:403) say that a student with a learning style which is efficient, effective and versatile can overcome these problems. According to Baker et al. (1985:1496) teachers can become more effective by permitting some flexibility in instruction procedures and by improving resources for different learners.

Talarczyk (1989:265) undertook a study to determine whether learning styles of nursing students predicted success. No significant relationship could be found (Talarczyk 1989:269). She did however suggest that knowledge of the learning styles of nursing students may be helpful in giving direction for planning a curriculum. She also suggested that those students at risk should be given remedial education or supportive programmes in which ways of structuring the educational environment could be identified to maximise the achievement of these students (Talarczyk 1989:265).

Blagg (1985:89) undertook a study to determine whether learning style variables are predictive of success in a graduate allied health education program. The Canfield Learning Style Inventory was used to measure the learning style preference and the academic success was measured by examination scores. No significant relationship was found between learning style preferences and academic achievement, but some learning style preferences could have been predictors of academic success. It was noted that when instructional styles matched the preferred learning style, students reacted more favourably. Where there was a mismatch, students were at a disadvantage (Blagg 1985:94-95).

Hodges (1988a:68) examined the learning styles, personality types and sex-role identification of nursing students. The preferred learning style of the group was found to be concrete in nature. The findings also indicated the typical beginning nursing student to be in favour of a learning environment where a caring relationship with the teachers exists, as well as structure, the use of practical material that relates to the concreteness of real life, learning activities that require active participation and direct experience such as group discussions, role play and simulations. In another study undertaken by Hodges (1988b:342) nursing was identified within the concrete/reflective quadrant of the Kolb model, which includes the arts, humanities and social sciences. It therefore suggests that some general correspondence exist between learning styles and a nursing career.

Laschinger and Boss (1984:375) compared the learning characteristics of incoming nursing students to those of more advanced nursing students. The majority of the students were found to have concrete learning styles. A greater incidence of the advanced students had concrete learning styles, which suggests increasing concreteness with exposure to nursing education. The students with concrete learning styles were also more influenced by person-oriented factors in career choices than those with abstract learning styles. These researchers also supported Kolb's theory of experiential learning and its use in examining learning characteristics of nursing students (Laschinger & Boss 1984:380).

In an assessment on the importance of student learning styles as variable in four-year baccalaureate nursing programs, Haislett, Hughes, Atkinson and Williams (1993:70) summarised their research by saying that the Kolb model of experiential learning can be used successfully to identify nursing students who might have difficulty in achieving academic success. This study analysed four-year baccalaureate student's learning styles which were assessed by Kolb's Learning Style Inventory. The relationship between their learning styles and academic performance as measured by the grade-point ratio, was investigated. They also studied behaviours and attitudes of the students. The study indicated that the sample used mainly consisted of assimilators and divergers, which makes reflective observation the most common mode of learning. The grade-point ratio of the assimilator/diverger group was significantly higher than that of the accommodator/converger group. They finally suggest that by attending to how nursing students learn and not just what they learn, will help them to become complete and flexible learners. By developing skills in each of the four learning styles of the Kolb model of experiential learning, the students will eventually be able to handle the increasing demands of the nursing profession with confidence (Haislett et al. 1993:69-70).

Merritt (1983:367) undertook a study to determine how the learning style preferences of basic (traditional) and post-registration (non-traditional) nursing students correlate with age and nursing profession experience. According to the results, the age of the young basic nursing student and the age and work-related experience of the registered nurse (post-registration) students did not account for differences in the learning style preferences of these groups of students, using the Kolb model of experiential learning and the Canfield model of learning. The non-traditional adult learner was identified as being less positively oriented towards the learning environment than the traditional learner. Both these learners prefer structured environments, with clearly defined course expectations and requirements, and logical, organised content. Non-traditional learners prefer instructional methods which include both active and passive modes of learning. They also prefer not to set their own goals, pursue their own interests or be exposed to situations where positive relationships with peers and the instructor are promoted. Traditional learners prefer active involvement like direct contact with the situation or content being studied. They also favour the development of positive relationships with peers and instructors, but are not particularly concerned with setting their own goals. Both groups tend not to prefer teacher-controlled and competitive environments.

Although both groups do not prefer the reading mode, the non-traditional student is more positively inclined to this mode (Merritt 1983:371-372).

2.7 THE MARSHALL AND MERRITT LEARNING STYLE QUESTIONNAIRE

The Marshall and Merritt Learning Style Questionnaire was designed by Marshall and Merritt (1986) to assess individual learning styles within an experiential learning model. They realised that there was a need for a new instrument for assessing the constructs defined in the experiential learning model (Marshall & Merritt 1986:257). Criticism arising from different research projects against the Kolb Learning Style Inventory used in the experiential learning model encouraged them to design a more adequate instrument (Marshall & Merritt 1986:257). The inadequacy of other learning style instrumentation was also indicated by other researchers (Moelwyn-Hughes & Sayed 1993:17; Welman & Huysamen 1994:263).

The newly designed Marshall and Merritt Learning Style Questionnaire is comprised of forty word pairs which are given in a semantic differential format. A five-point response mode is allocated to each of the forty items. The items indicate which words are characteristic of the respondent (Marshall & Merritt 1986:258).

The Marshall and Merritt Learning Style Questionnaire was developed from an instrument called the Learning Style Questionnaire Experimental form (LSQ-E) which consisted of 100 semantic differential word pairs. Each of the four scales in the Kolb model of experiential learning were assessed by 25 word pairs. A five-point scale was used to rate the consistency with which the word pairs characterised their particular learning style. Randomly collected university students were given the questionnaire to complete. A statistical analysis determined the ten highest loading items for each of the four scales of the Kolb model of experiential learning. The selected 40 items were again factor analysed and the alpha reliability was determined for the four scales and the two bipolar dimensions (Marshall & Merritt 1986:259).

Marshall and Merritt (1986) undertook a study to validate the instrument. Results of this research study suggested that the instrument was valid. The Marshall and Merritt Learning Style Questionnaire, as a 40 item semantic differential scale, was given to 543 students at two universities. This study suggested that the instrument is construct valid and reliable. High reliability was demonstrated in three of the four scales as well as for both bipolar dimensions. Construct validity was also demonstrated. Because of its normative format, the Marshall and Merritt Learning Style Questionnaire can be used for statistical research as well as for individual student diagnostics.

Marshall and Merritt (1986:262) suggested that their instrument could be used as a teaching tool in situations where students are taught how to integrate the learning processes and learning styles. This supports the reason for this research project. In distance education especially, it is important to teach the student how to integrate her learning style into the learning process to enable her to reach the maximum level of academic achievement.

2.8   CONCLUSION

In this chapter the researcher strived to discuss important, applicable research done on the learning styles of students worldwide. The importance of knowing the way in which students perceive and organise information, is highlighted. As the Marshall and Merritt Learning Style Questionnaire is being used as part of the research instrument for this research project, it was necessary to outline its development. The study of available literature on the subject has not revealed any research done on the learning styles of nursing students in South Africa.

In the following chapter a discussion on nursing education and in particular nursing education at Unisa, will clarify the specific situation of the Unisa nursing student. The Unisa nursing student will also be described.

■ ■ ■

CHAPTER 3

THE NURSING STUDENT WITH SPECIAL REFERENCE TO THE UNISA

NURSING STUDENT

3.1   INTRODUCTION

In 1937 university education for nurses became a reality in South Africa. Post-registration diploma courses were introduced into the universities of Cape Town and the Witwatersrand. Only in 1956 nurses were accepted to register for a baccalaureate degree in nursing (Brownlee 1982:1). Negotiations between the South African Nursing Council and Unisa led to the establishment of the Department of Nursing Science in 1975 (Brownlee 1982:2). In 1976 the first nursing courses were introduced into the newly established department (Brownlee 1982:115; Paton 1988:1).

The need for distance education for nurses has been recognised in many countries, more particularly where similar circumstances prevailed to those in South Africa. Circumstances like the geographical setting of the universities, limited facilities available to some races, added responsibilities of the working woman and the domestic and familial responsibilities of married as well as single women, make residential university education inaccessible to many nurses (Brownlee 1982:1).

This chapter focuses on the nursing student, with special reference to the Unisa nursing student. Demographic information on the Unisa nursing student forms a picture of the specific needs of the nursing student.

3.2 DISTANCE EDUCATION IN NURSING

Like most other modern-day men and women, the nurse of today realises that education and training of some kind, whether formal or informal, has become part of one's occupation. Learning is an ongoing process which can be put side by side with family and community life.

Distance teaching in tertiary education can satisfy the need for growing and acquiring new knowledge, skills and techniques that makes life more fulfilling (De Munnik 1993:87). De Munnik (1993:89) quotes a brochure of the Fernuniversität in West Germany regarding distance education as follows:

> *distance education has become an important instrument of additional qualification for the labour market and can contribute to opening up new occupational perspectives.*

Unisa offers nursing studies through distance education or teletuition. Distance education is tuition by correspondence through the written word (Steyn 1992:64). Study guides, tutorial letters, practica workbooks, prescribed and recommended reading material, personal correspondence and the submission and evaluation of assignments all form part of the written tutorial material at Unisa.

More personal additional methods of communication with students include practica workshops, discussion groups, telephone conferences, radio programmes and interviews which counteract the feelings of deprivation and loneliness that some of the students may experience (Brownlee 1982:104-105).

In distance education the relationship between the lecturer and student is of great importance. To accomplish effective teaching and learning, this relationship, with very clear role commitments, must be the core of distance education (Steyn 1994:36).

Distance education in nursing fulfils a need for learners who are not able to attend residential universities. The rapid changing role of the nurse and nursing, new knowledge and techniques and contemporary health issues and problems which affect the quality of services she renders make it essential that she be given the opportunity to extend her knowledge and skills through a more accessible education. Unisa plays an important role in assisting the nurses all over the country and in other countries to fulfil this essential need to keep abreast.

Unisa gives nurses the opportunity to obtain a university education, irrespective of their circumstances, and also serves the labour market by preparing the students to become well-qualified practitioners, without having to withdraw temporarily from the labour market.

3.3   NURSING EDUCATION AT UNISA

Nursing as a caring profession has an obligation regarding opportunities for all its members to develop their skills and abilities in order to reach their highest potential. A profession is committed to motivating and assisting its members to develop their potential and grow to an optimal level (Mellish & Brink 1990:5-7).

When the nursing courses were introduced at Unisa, the objectives were solely to create opportunities for a great number of nurses to develop themselves to meet the increasing demands for well-qualified practitioners in the fields of nursing education, nursing administration, and community health nursing (Brownlee 1982:200; Paton 1988:1). Today the Department of Nursing Science at Unisa is one of the largest nursing departments of its kind in the world (Beukes 1994).

Like any other teaching department, the Department of Nursing Science at Unisa strives towards excellence in the process of shaping, moulding and developing each student to their fullest potential in their search for success (Beukes 1994).

3.3.1 The curricula offered to obtain a nursing qualification at Unisa

The Unisa nursing course is a Baccalaureate degree in Nursing Science, called the BA(Cur) degree. This degree offers a selection of six curricula. Each curriculum is comprised of twelve courses. The two major subjects for each of the six curricula respectively are:

- nursing education and nursing administration;

- nursing education and community health nursing;

- nursing education and ethos and professional practice;

- nursing administration and community health nursing;

- nursing administration and ethos and professional practice; and

- community health nursing and ethos and professional practice (Unisa 1994a:103-107).

The nursing degree offered by Unisa is a post-registration course. Proof of current registration with the South African Nursing Council as a general nurse or psychiatric nurse with the South African Nursing Council, is compulsory when enroling for the degree. When selecting nursing education as a major subject, which includes the didactics of midwifery, psychiatric nursing or community health nursing, the student must submit proof of current registration in the selected discipline. In the case of a foreign student, proof of registration with the student's own country's registration authority is essential (Unisa 1994a:101).

3.3.2 Practica requirements for the Unisa nursing course

The subjects nursing education, nursing administration and community health nursing have a compulsory practical component. The practica requirements are considered an absolute necessity and consist of both a laboratory workshop and a practical component

in the field of speciality. The laboratory workshops are conducted by the lecturers of the department or experts in the field, whereas the service authorities provide the facilities for the practical component. Some of the practica are also done in the community (Unisa 1994a:107).

3.4   THE NURSING STUDENT

For a person to commence a course leading to registration as a nurse, at least a standard ten certificate is necessary, which includes a minimum of twelve years successful schooling. Until the early seventies, persons who were qualified as enrolled nurses with only a standard eight certificate, could still be admitted to the course for registration as a nurse.

Most of the neophytes are approximately eighteen years old. There are a minority of exceptions where the persons have decided on a nursing career later and are therefore older when they commence their nursing studies. The Unisa nursing student is not a neophyte and differs from the other nursing students as they are already qualified practitioners.

Already in the early 1930's the nurses recognised the value of post-registration education. The vast inputs of knowledge and technological advances, should inspire today's nurse to further her education. A nurse cannot afford to remain passive or complacent about her traditional place in the health team. She cannot plead ignorance of new concepts or practices, or show reluctance to adjust to the tempo of the present evolvement. Previous aptitudes must give way to new skills, rigidity to flexibility, passivity to dynamic action, all to ensure professional competence and security. Nurses must be prepared at the highest level to accept their responsibilities, to acknowledge their accountability and to move into their rightful place as practitioners, educators, researchers, problem-solvers, decision-makers and innovators (Brownlee 1982:1-4).

Teaching and learning are lifelong processes in every discipline of the educational system. Students as well as accomplished practitioners must be willing to accept learning

as an ongoing process which is influenced by social changes, skills, techniques, research, changing health and disease patterns and the management of health services.

3.5   THE UNISA NURSING STUDENT

The Unisa nursing student probably has different characteristics from other Unisa students. When students enrol for a nursing course at Unisa, they already have at least four years of study experience, because of their basic nursing training. They are not school-leavers. Unisa nursing students thus have different study experience from many other Unisa students.

Their previous study experience will bring along unique learning needs. These adult learners often have practised academic skills of their own (Cleverly 1994:438). They probably need to learn independently and according to their learning-readiness.

Unisa nursing students, like the other Unisa students, have a need to organise their learning to suit their specific professional and personal needs (Steyn 1994:48). These students usually also have extensive experience of life and many aspirations for self-fulfilment.

Brownlee (1982) undertook a thorough study on the Unisa nursing student. She stressed the importance of the profession's commitment to motivating and assisting all its members to develop their potential to the full, irrespective of the level or sphere in which they are practising (Brownlee 1982:4). The Unisa nursing student shows commitment to her study by her past and present study. A nurse who does a post-registration course, in own time and at her own cost, demonstrates a professional attitude of commitment to continuing education. As adults, they recognise their commitment to lifelong learning (Brownlee 1982:450; Paton 1988:42).

Responsibility regarding their own studies as well as the understanding of the need for continuing education is well shown in the number of nursing students completing the post-registration courses at Unisa (Beukes 1992:35). During an interview with Brownlee (1982:112), the then Vice-Principal (Tuition), Professor B.S. van As, remarked that the nursing student is possibly more conscientious and disciplined than other university students.

Paton (1988) undertook a study to compile a career and professional profile of the persons who completed the Unisa course in nursing education in the decade 1976-1985. She came to the conclusion that the Unisa nursing students are generally committed to the nursing profession, which is evidenced by their career development and their need to further their education. Many of the Unisa students or intending students already hold leadership positions. They also continue serving the profession after obtaining the degree, and often move higher up in the professional ranks (Paton 1988:29-30, 42).

Merritt (1983:367) describes the student who is older than the traditional college student and who has significant practical or work experience, as a non-traditional student. Students who have assumed the social roles associated with adulthood, and who have perceived themselves as being responsible for the conduct of their lives, are classified as non-traditional students. Seidl and Sauter (1990:13) described non-traditional students as returning adult learners, highly motivated with a breadth of work experience. They were also described as typically older than 25 with previous tertiary education experience and holding a full-time post (Seidl & Sauter 1990:14).

The Unisa nursing student can be identified as a non-traditional adult learner. Since these older learners are less positively oriented towards the conditions and modes of learning commonly associated with formal educational settings, distance education is expected to suit them well (Steyn 1994:46).

According to Kolb (1984:3) many non-traditional learners prefer experiential learning as the method of choice for learning and development. Non-traditional adult learners have reached a stage in which they accept responsibility for their own actions and behaviour.

Non-traditional learners have different learning styles and thought patterns. It is essential that as far as possible provision should be made for independent and unique learning.

It is said that non-traditional learners want to achieve (Merritt 1983:371). Support and guidance regarding their learning styles will also make the learning process less stressful and more successful (Steyn 1994:39).

During interviews with nursing students, Nelson (1979:25) identified a group of students who were concerned about their ability to learn. This group had been out of school for a number of years. Some of these students had done very well in previous courses. Because of the time elapsed since their last course, many of these students expressed concern that they might not be able to complete their current course successfully. A Study Skills Workshop was held with great success. An important conclusion that derived from this, was that if a student learns how to learn, approach and organise the material she must master, academic achievement is a more reliable reflection of her true capabilities (Nelson 1979:25, 38). Many of the Unisa nursing students have had long intervals between courses and often experience the same problems.

Findings of a research study undertaken by Merritt (1983) did not support the proposition that age and career employment are indicators for differences in the ways that adults prefer to learn. It did however, suggest that the non-traditional student is less positively oriented towards the modes and conditions of learning associated with formal classroom settings, than traditional young students. Non-traditional students also tend not to prefer teacher-controlled learning environments (Merritt 1983:371-372). In her conclusion Merritt (1983:372) said that these students may need assistance with the learning process and learning behaviours which are expected of them.

3.5.1 Demographic profile of the Unisa nursing student

The demographic profile of the Unisa nursing student should clarify the characteristics of these students. Being post-registration students, their profile differs somewhat from other

undergraduate Unisa students. By identifying the specific characteristics, and therefore understanding their needs, changes in and adaption to the teacher-learner relationship as well as in the approach to the learning situation could be made.

3.5.1.1 Age

According to the profile of the Unisa nursing students, compiled by the Bureau for Management Information in 1994, the mean age of the students is 36.67. The majority of students are between the ages of 30 and 34 (Unisa 1994b:1).

Paton's findings on the age distribution of the Unisa qualified tutors were that most of the respondents (82,5 percent) were between 30 and 49 years old. The mean age for this group was 41.7 (Paton 1988:65). These respondents were slightly younger than those in the study on registered nurse tutors in South Africa undertaken by Brink (1984:125) where the mean age was 42. The reason for the mean age of these groups being higher than the current figures given by the Bureau for Management Information (Unisa 1994b:1), is most probably because the respondents used in both the above-mentioned studies have already completed their nursing courses with Unisa.

It is clear from the statistics that the average Unisa nursing student is not an adolescent who is still seeking a complete self-image. Additional responsibilities on account of their position in the community and circumstances (as mentioned earlier), change their specific needs as students.

3.5.1.2 Sex

The majority of nurses and students in nursing are female. According to Mellish and Brink (1990:54) 3.4 percent of the registered nursing population in 1988, were male. The largest number of these male nurses are found in the semi-skilled category. This means that most of them will not be able to enrol for the Unisa nursing courses.

Respondents in Paton's study (1988:63) included only 3.8 percent male. She therefore made no comparison on the basis of gender.

The most recent statistics for 1994 indicate that 95.91 percent of the Unisa nursing students in that year were female students and only 4.09 percent male students (Unisa 1994b:1). As in the past, the nursing student as well as the registered nurse population is predominantly female.

3.5.1.3 Cultural background

Nurses and students of nursing come from a variety of cultural backgrounds with different home languages.

From 1977 onwards the Black Unisa nursing student population has been far in the majority. By 1980 the registrations from this group more than doubled the number of White students (Brownlee 1982:113). The statistics for 1994 again showed that the Black student population was far in the majority with 77.98 percent, against the 13.99 percent White students, 3.32 percent Indian students and 4.70 percent Coloured students (Unisa 1994b:1).

The reasons for this specific distribution of population groups may be because of the geographical location of the students, problems in availability to and accessibility of all races to all universities, or the size of the Black population.

Statistics indicating the home languages of the Unisa nursing students for 1994, showed that the majority (18.42 percent) of the students were Xhosa speaking, with the Zulu speaking students (17.28 percent) the second largest group. Students who were Afrikaans or English speaking represented a total of 22.34 percent (Unisa 1994b:1).

The medium of nursing education at Unisa is either English or Afrikaans, which means that neither of these languages is the home language of the majority of the nursing students at Unisa. The majority of the 1994 Unisa nursing students (77.66 percent) thus have to study in a language other than their home language (Unisa 1994b:1).

Having to cope with scientific study in their second or even third language, causes problems. Teaching nursing students of different population groups, needs great understanding and calls for a lot of support in the teaching-learning situation. Different cultural norms, customs and values also pose difficulties in nursing education. Teaching nutrition or child care may cause difficulties when all the various food taboos are taken into account. Family planning also differs from cultural group to cultural group. The westernising of some groups who have not yet renounced their traditional culture, causes problems such as normlessness. Although caring for the sick does not know the boundaries of race, colour or language, the education of nurses of all population groups need special assessment and planning (Luthuli et al. 1992:30-32).

3.5.1.4 Marital status

The percentage of married students was higher amongst the Unisa nursing students than amongst other nursing students who were being used in studies related to nurses in South Africa. Paton's findings were that between 66,3 and 67,4 percent were married (Paton 1988:66). In Brownlee's study (1982:179) there was a total number of 74.2 percent married respondents at that time.

It is generally said that study through Unisa is more compatible with family responsibilities, in terms of time and geographical location, than study at a residential university. It is however also true that family life brings along more responsibilities which limits time to study and often influences learning.

In the modern South African society, traditional forms of marriage and single parenthood are common. Marriage is also not an indication for personal responsibilities. The Bureau

for Management Information at Unisa does not supply statistics regarding the marital status of the Unisa nursing student, as they do not find it necessary or relevant. It is therefore not possible to indicate the number of married Unisa nursing students at present.

3.5.1.5 Scholastic status

A holder of the following certificates will be allowed entrance to the university for a Bachelor's degree like the BA(Cur) degree:

- a matriculation certificate, certificate of full or conditional exemption from the matriculation examination, senior or school leaving certificate with a matriculation exemption endorsement, issued by the Joint Matriculation Board;

- a senior certificate with university or matriculation admission endorsement issued by the South African Certification Council; and

- a certificate of exemption or conditional exemption issued by the Matriculation Board of the Committee of University Principals (Unisa 1994a:14-15).

According to the 1994 statistics for the students enrolled for the BA(Cur) degree; 41.26 percent of the students hold matriculation with full exemption; 0.02 percent hold another qualification for full or conditional exemption; the qualification of 2.81 percent is unknown; 52.09 percent hold a conditional exemption and 3.82 percent hold a certificate of conditional exemption on grounds of age (Unisa 1994b:3).

3.5.1.6 Basic nursing qualifications of the Unisa nursing students

Although the statistics given by the Bureau for Management Information do not indicate which students have obtained their basic nursing qualifications with a degree, it is clear from the statistics of previous tertiary institutions, that more qualified at a nursing college,

in other words hold a diploma in general nursing. According to the statistics 1.32 percent of the students of 1994 hold degrees from other universities. This is however not a clear picture because the statistics indicated that 82.68 percent of the students were previously from Unisa, which means that they were registered students with Unisa in 1993. Where their basic nursing studies were done, is therefore not known (Unisa 1994b:2).

The majority of the respondents (81.4 percent) used in Paton's study, held a diploma as basic qualification (Paton 1988:73).

3.5.1.7 Posts held by Unisa nursing students

The 1994 statistics indicate that 97.44 percent of the registered students held a post in nursing services (Unisa 1994b:2). Unfortunately these statistics do not indicate the specific posts held by the students.

Paton's findings showed that most of the respondents held teaching positions and nursing service managers were the second largest group (Paton 1988:88).

3.6   CONCLUSION

Unisa offers an opportunity to adults to further their education through distance teaching. The Department of Nursing Science at Unisa provides the nursing profession with an opportunity to develop the potential of their members.

The Unisa nursing students can be described as non-traditional students. Although non-traditional students need support in the teaching-learning situation, they want to learn independently and according to their own specific needs.

The demographic profile of the Unisa nursing students differs from other Unisa students and other nursing students. From the discussion in this chapter, the conclusion can be drawn that the majority of Unisa nursing students hold posts in the field of nursing. Specific aspects like work-related responsibilities, age and cultural background may have an effect on the learning process and therefore the academic achievement of these students.

In the following chapter academic achievement and its measurement will be discussed.

■ ■ ■

CHAPTER 4

ACADEMIC ACHIEVEMENT OF THE UNISA NURSING STUDENT WITH SPECIAL REFERENCE TO THE THIRD YEAR STUDENT

4.1 INTRODUCTION

The academic achievement of a Unisa student is interpreted through the examination results at the end of the year. The examination is a very important event which should be approached carefully, well-prepared and motivated. The quality of the examination paper must adhere to criteria such as validity, reliability and objectivity.

During their third year, students experience different situations which may affect academic achievement. Although they are at the end of a course, they also stand before new challenges like career opportunities and post-graduate studies.

This chapter gives an overview of how a high level of academic achievement can be reached and how it can be affected by certain factors, such as the examination which evaluates the academic achievement of a student.

4.2 ACADEMIC ACHIEVEMENT

Academic achievement refers to the successful acquisition of a particular skill at a place of learning especially a college, university or academy. It is excessively concerned with intellectual matters (Collins 1986a:4, 7).

Quinn (1988:335) defines academic achievement as how well a student performed in the past. Assessment is concerned with the measurement of achievement as well as

individual differences like attitudes, personality and intelligence. According to Monteith (1988:23) academic achievement is the result of learning.

Reilly and Oermann (1992:422) maintain that academic achievement projects a single entity that is global in nature. It represents many interrelated components within the context of the learning objectives and aims, and the purpose of the curriculum (Malan & Du Toit 1991:152).

According to Monteith (1988:23) academic achievement cannot be seen as a true variable, because it is the result of an interaction of various variables which may differ from year to year. As predictors of academic achievement, these variables include cognitive, non-cognitive and environmental factors. Together these different factors determine the learning style of the student.

In their research on the relationship between the social origins, aspirations and academic achievement of Australian youth, Carpenter and Western (1984:64) stated that academic achievement is affected by various factors which are the result of the interaction of the inner dispositions of an individual and certain environmental or external factors over which the student/individual does not always have control. They developed a model of academic achievement which included the involvement of social processes. During this study the researchers did not only make use of examination results but also took into account social origins like sex and geographical location. They did however, define academic achievement as "final high school academic results" (Carpenter & Western 1984:66, 70). It is also sometimes described as educational achievement (Carpenter & Western 1984:78). The results of this study indicated that there is a relation between academic achievement and social background (Carpenter & Western 1984:63, 78).

In an article on the individual in mass education, presented by De Munnik (1993:86-89), the academic achievement of students from different universities was discussed. According to statistics of The British Open University, the pass rate of the part-time students did not differ from the pass rate of the full-time students. From this discussion the conclusion can be made that academic success can be achieved through distance education.

From Monteith's work (1988:33) the conclusion can be drawn that a student reaches higher academic achievements if she knows her learning style and is in control of her own learning process. Miller et al. (1987:400) agreed by saying that a student with a well-defined learning style will reach a higher level of academic achievement.

Markert (1986:781) investigated the learning styles of medical students and their performance. The results of this study demonstrated that medical students, classified according to the Kolb model of experiential learning as convergers, performed better on objective examination than students with other learning styles (Markert 1986:782). According to Markert (1986:782) these findings were consistent with work done by Kolb.

The primary goal of the research done by Miller et al. (1987:400) was to determine which learning styles could be associated with higher academic achievement. The results indicated that the students with high grade point averages could be associated with a learning style which is characterised by good organisation of information, key factors and supporting details as well as meaningful associations. These aspects indicate that students work to integrate, understand and apply the information that is being processed. Such learning styles are associated with better academic achievements (Miller et al. 1987:402). They furthermore argued that ineffective learning styles, rather than differences in abilities bring about low grade point averages (Miller et al. 1987:403).

Welman and Huysamen (1994:258) reported Kolb's findings that American research has found a relation between students' preferred learning styles and success in their studies.

According to Van Schalkwyk and Scheepers (1991:19) learning style is an important variable contributing to better understanding of an individual's academic performance. For them, research on learning styles of students is very important.

4.3 ASSESSMENT OF ACADEMIC ACHIEVEMENT

Assessment can be defined as the evaluation, determination or estimation of the value or property of something. It is also synonymous to appraisal, judgement, rating or evaluating (Collins 1986a:45; Collins 1986b:32).

Assessment in nursing is described by Quinn (1988:365) as ways of ascertaining whether or not competence in nursing practice has been acquired. An assessment generates or provides the data upon which the student is evaluated. The data leads to registration with the statutory body (in South Africa it is the South African Nursing Council) in a specific field of nursing. Therefore:

> ... evaluation is a process of ascertaining the worth or significance of something by detailed appraisal and study (Quinn 1988:365).

Assessment can act as both motivation and stressor for students, but it is certain that assessment in some form or other will remain an indispensable part of any educational system in the foreseeable future. Students are encouraged to compete with themselves, not with others, and to do the best they can. If examination results represent a student's best effort, even average marks are acceptable (Nelson 1979:26).

According to Quinn (1988:334) there is a real danger that the assessment may dominate the nursing curriculum and that the curriculum may be geared to the passing of the terminal examination. This may restrict innovation and creativity and may affect the student with 'certain' learning styles. Grässer (1988:24) is also concerned about the possibility that students are merely prepared for and guided towards the examination and calls it "ill-education".

Formal assessment of academic achievement involves the use of marks obtained in tests or assignments and in examinations. When a comparison is drawn between the results and learning styles, formal assessment must be used. Examples of formal assessment in

nursing education are modular examinations, final or end of the year examinations and clinical assessment, as approved by the statutory body (Quinn 1988:335).

Informal assessment is a private and subjective evaluation or observation of students' behaviour or examination of students' notes and is made from informal interviews and contact. It therefore cannot be used to draw a comparison between the students' academic achievement and the learning styles or between different students (Quinn 1988:335).

In her research on the nursing student at Unisa, Brownlee (1982:261) used academic achievement in the context of success in the end of the year examination and not of professional progress in the practical sphere.

In this research project the end of the year examination results will be used to describe academic achievement. This examination is a formal evaluation of a student's level of ability after the completion of certain learning tasks (Malan & Du Toit 1991:153). It can be accepted as a way of measuring the academic achievement of a student.

4.4   EXAMINATION AS MEASURE FOR ACADEMIC ACHIEVEMENT

Examination means to test the candidate's knowledge and skill by inter alia written exercises or oral questions (Collins 1986a:292). Results refer to the final score, outcome or consequence that ensues from an action (Collins 1986a:727).

Examination should test two aspects, namely the understanding and knowledge; and the ability to apply the knowledge. It should not only test the student's ability to cram and regurgitate the studied facts (Grässer 1988:29). According to Petrick (1988:188) examination evaluates the learning effect as well as the teaching effect. The learning effect is the outcome of the learning process. The teaching effect is an evaluation of the way in which the objectives for the specific subject matter have been achieved.

Although extremely important, examination results are only one aspect of assessment in nursing education. The success of the Unisa student is dominated by the end of the year examination as this is the only way of measuring the academic achievement of the distance education student. After obtaining the score or marks of the student a value judgement is made about whether the score is good or poor.

The use of numerical data in the assessment of students, is called quantitative assessment, whereas qualitative assessment is concerned with the qualities and properties the students possess (Quinn 1988:335). The researcher will make use of the quantitative data; that is the score the student obtained in the final written examination at the end of the third year course.

An examination must be valid, reliable and objective to be effective. Validity means that the examination paper must measure what it is supposed to measure. For an examination to have content validity, it should sample adequately the content of the syllabus. It must therefore correlate with the objectives set for the learning content. Reliability means that the evaluation must be done in such a way that all the students are evaluated in the same way. For an examination to be objective, the evaluation and evaluator must not be prejudiced. An examination must discriminate between the better and the weaker student. The content of the examination must be comprehensive and not allow the student to 'spot' (Petrick 1988:190; Quinn 1988:337-338).

An examination must be seen as a meaningful learning experience where the student has the opportunity to arrange, systematise, classify, analyse and synthesise. A balanced examination paper will therefore include different types of questions, in order to include lower and higher cognitive level questions (Grässer 1988:29).

The end of the year examination usually consists of both essay and objective tests. In the essay type question the student is required to supply an answer which is organised in her own words and presented in her own style, whereas the objective type question requires the selection of an answer amongst alternatives (Quinn 1988:338-339, 344). Marks that are assigned to essays in the examination indicate the degree of achievement attained for that essay.

The questions asked in an examination paper can be divided into two main groups, namely the essay type questions (essay tests) and the objective item questions (objective tests). Petrick (1988:1) suggests that both these types of questions must be used in distance teaching.

4.4.1 Essay tests

The essay tests can further be subdivided into paragraph type questions and the longer essay type questions. The essay type questions give the student the opportunity to select and organise the information and then, through insight and comprehension, arrange it into a logical, original and finished written answer (Petrick 1988:2).

- Advantages and uses of essay tests

Essay tests are useful in assessing higher levels of cognitive functioning like insight, application, analysis, synthesis or evaluation. They also serve as an indirect method of assessing the affective domain like opinions, values and attitudes. The information must be organised efficiently and this requires organisation and expression of own opinions (Quinn 1988:340). The 'guess-factor', as in objective tests, is minimal (Petrick 1988:3).

Essay tests received the highest preference as evaluation method in a research study done by Fransman (1991:76). The reason for this, he argued, could be ascribed to the fact that students are familiar with this method. An evaluation method should always elicit meaningful learning and do justice to students' academic performance.

- Weaknesses in essay tests

Only a small number of questions can be asked and therefore it has a low content validity. A wide variation between markers and between the same marker at different times gives a low marker reliability. The marking of these questions is also time-

consuming. Students with an untidy handwriting, poor knowledge of the language, poor spelling ability and those who write slowly, are at a disadvantage (Petrick 1988:3; Quinn 1988:341).

4.4.2 Objective test

The word *objective* refers to the marking of this type of question. The marking of these tests is not influenced by the subjectivity of the marker. There is perfect marker reliability because there is a predetermined answer. There is also an adequate syllabus sample which makes the content validity very high. The marking is objective because there is no or very little marker fatigue. The marking of some of these questions can even be done by computer or by clerical staff. They do not however test very high levels of intellectual functioning, because it is not always possible to formulate questions in such a way that they can test knowledge on higher cognitive levels (Quinn 1988:344).

Objective tests are classified into different groups.

- Multiple-choice items

These questions consist of three parts. The stem contains the statement or problem, the key is the correct response and the distracters are the incorrect responses. Items are usually in written form but diagrams, pictures, graphics and sketches can be included in such questions. To reduce the chances of guessing, it is better to give at least three options, but preferably four to five options. The distracters often indicate the effectiveness of the item. Because this type of question is less susceptible to guessing, it is a popular choice (Petrick 1988:8-11; Quinn 1988:344-345).

- Matching items

The matching item consists of two lists in columns. The items in the first column must be matched with the responses in the second column. The lists can include terms, phrases, definitions, statements, contentions and specific relations between facts. An accompanying instruction is necessary to explain the conditions of matching. More responses than questions are usually given in order to reduce the 'guess-factor'. It is not always possible to find enough learning matter to compose a homogeneous list (Petrick 1988:6; Quinn 1988:345).

- True-false items

A true-false item is a statement which can be true or false. The 'guess-factor' is a problem in these types of questions. It is not always easy to formulate a true-false question and ambiguous wording decreases the validity of the test (Petrick 1988:8; Quinn 1988:345).

- Short-answer items

A statement or question is given in which the student must supply the missing word, term or phrase. These items are used in testing lower cognitive levels of functioning. Although the 'guess-factor' is low, more than one answer is often possible, which makes the objectivity questionable (Petrick 1988:4-5; Quinn 1988:346).

The end of the year examination papers of the Department of Nursing Science at Unisa usually consist of both essay tests and objective tests. Essay tests are sometimes in essay form and sometimes in shorter structured form (paragraph type). The above-mentioned types of objective tests are the most used types.

An end of the year examination has a big drawback in that it may be a 'one-off' performance on the day of the examination and those results may then not reflect the student's typical academic performance (Quinn 1988:336). In an article presented by Fransman (1991:73), examination was indicated as the only means available in education to measure the academic ability of a student. In spite of this, it is important that examination evokes meaningful learning and not merely learning of a reproductive nature.

Fransman (1991:73) illustrated a sceptical view of examination in that he quoted different opinions on examination as evaluation practice. According to him, students who can remember or reproduce better than others, are placed at an advantage. In this case, the type and structure of the examination plays a role. The fact that students learn in order to pass examinations, is according to him also true. Previous research also explained that many students learn superficially to eventually cover all the study material for the examination. This exercise is meaningless to the student. The results of Fransman's research on learning styles from an evaluation point of view, revealed that students prefer meaningful learning and infusion and want to adopt a meaningful learning style. Meaningful learning is defined as

> ...understanding learning material; asking questions; reaching a logical conclusion; grasping the meaning of the learning material (Fransman 1991:74).

Infusion is defined as

> ...higher order skills like evaluation, synthesis and analysis; the student applies a critical mind to the solution of the problems; ability to analyse, relate, structure something which previously appeared to be disorganised (Fransman 1991:74).

A meaningful relationship should therefore be found between a well-balanced examination and ways of learning (Fransman 1991:73).

4.5   MOTIVATION IN THE LEARNING SITUATION

Motivation means to give incentive to something, in this case the learning process (Collins 1986a:552). It is synonymous with ambition, desire, drive, inspiration, interest or wish (Collins 1986b:335). Motivation can thus be defined as a process by which behaviour is initiated or changed, directed and energized towards a certain goal (Petrick & Wiechers 1985:143; Woolfolk 1990:302).

Motivation stems from intrinsic as well as extrinsic factors. When factors like interest, needs, curiosity, enjoyments etc influence motivation, it is called intrinsic motivation. When a student is intrinsically motivated, incentives or punishments are not necessary to initiate an activity, because the activity itself is rewarding and brings a sense of accomplishment. Therefore, when motivation is directed to the act of learning, it is called intrinsic motivation. Extrinsic motivation, on the other hand, is influenced by the reward to be earned, possibility of punishment or the way in which the student wishes to please the teacher. Extrinsic motivation has little to do with the activity or task itself and the student cares about what gain there will be for her. Therefore, when motivation is directed to aims that are not directly related to learning or studying, or the subject matter, and when it is merely a means to an end, it is called extrinsic motivation (Petrick & Wiechers 1985:143; Woolfolk 1990:303).

Both intrinsic and extrinsic motivation is necessary for learning to take place because the one supports the other. The learning intention is supported by the intrinsic motivation to learn and the extrinsic motivation complements it. If both are not present, the student will only learn that which interests her and not the sections which interest her less (Petrick & Wiechers 1985:143-144).

People are motivated by needs. A need is when one feels the lack of something or when one requires something (Collins 1986a:565). Needs are therefore any type of deficiencies or the absence of anything a person experiences, and which that person requires for her well-being. Needs are seldom ever satisfied completely and perfectly. One always wants to improve on oneself. This need to improve or the tension needs create, motivates people (Woolfolk 1990:313).

The need to achieve develops when a person strives for excellence in a field for the sake of achieving and not for the reward it brings. It is called achievement motivation and refers to the desire to excel and the striving for success and excellence. According to Woolfolk (1990:316-317) achievement motivation originates from childhood and these students are more determined to achieve after failure. Success gained too easily can however decrease their motivation. On the other hand, some people have a stronger need to avoid failure. This situation refers to resultant motivation. These students are usually discouraged by failure and encouraged by success (Woolfolk 1990:317).

A student is influenced by the motivation to achieve as well as the fear of failure. To resolve this conflict a student should eliminate the fear of failure. A level of achievement should be set. This level of achievement or aspiration is usually influenced and modified by successes and failures. The level of aspiration means the level of achievement the student would like to reach. The level of aspiration will be raised after a number of successful achievements, whereas it will decrease after a number of failures (Petrick & Wiechers 1985:144-145).

Motivation is needed to reach a level of achievement. Motivation is also vital for adult success (Moletsane 1992:106). Motivation to achieve will let the student study more actively and set a higher level of aspiration. This will be conducive to learning. If there is a will or desire to learn, the student will study better. In learning there is a personal involvement in the study material or the subject matter, which will motivate the student to study. The desire to learn indicates intrinsic motivation.

4.5.1   Personal involvement in learning and studying

The student's personal involvement in her studies will determine her motivation. Identification with or personal involvement in her studies will largely depend on the way in which the student made the decision to study. If the choice was made on external grounds, for example because all her friends are studying, her identification with the course will be poor. If however, the decision was based on personal considerations, for example to become a successful community health nurse, the approach to the course will be positive and motivated. When a student can identify with her studies and is personally

involved in the subject matter, there is a desire to learn and learning will take place more successfully (Petrick & Wiechers 1985:148-149).

4.5.2 The motivation cycle in the learning and studying situation

When a person is involved in a learning situation, she is involved with subject matter. The ideal learning situation originates where intrinsic and extrinsic motivation is present. **Figure 4.1** below illustrates a cycle of motivation. This cyclic presentation of motivation includes the following processes:

- (1-4) A student who decides to study further, is aware of the knowledge she already has. This means that she already has a particular self-concept of her abilities or knowledge of the subject (eg nursing). The nurse who has a need for learning or gaining more information, realizes the knowledge gap which exists and sets a goal of what she should know or what level of knowledge she should reach. Through intrinsic and extrinsic factors she is motivated to study to bridge the knowledge gap that exists.

- (5-9) By means of this motivation, the student becomes involved in the learning process. This intentional involvement in the subject matter is a prerequisite for successful learning. When the subject matter is mastered, learning takes place. The cognitive process of reception of the subject matter forms part of the process through which learning takes place. The learner gains insight into the abstract. The significant attribution of the cognitive process by putting meaning to the subject matter, brings about an experiential learning situation.
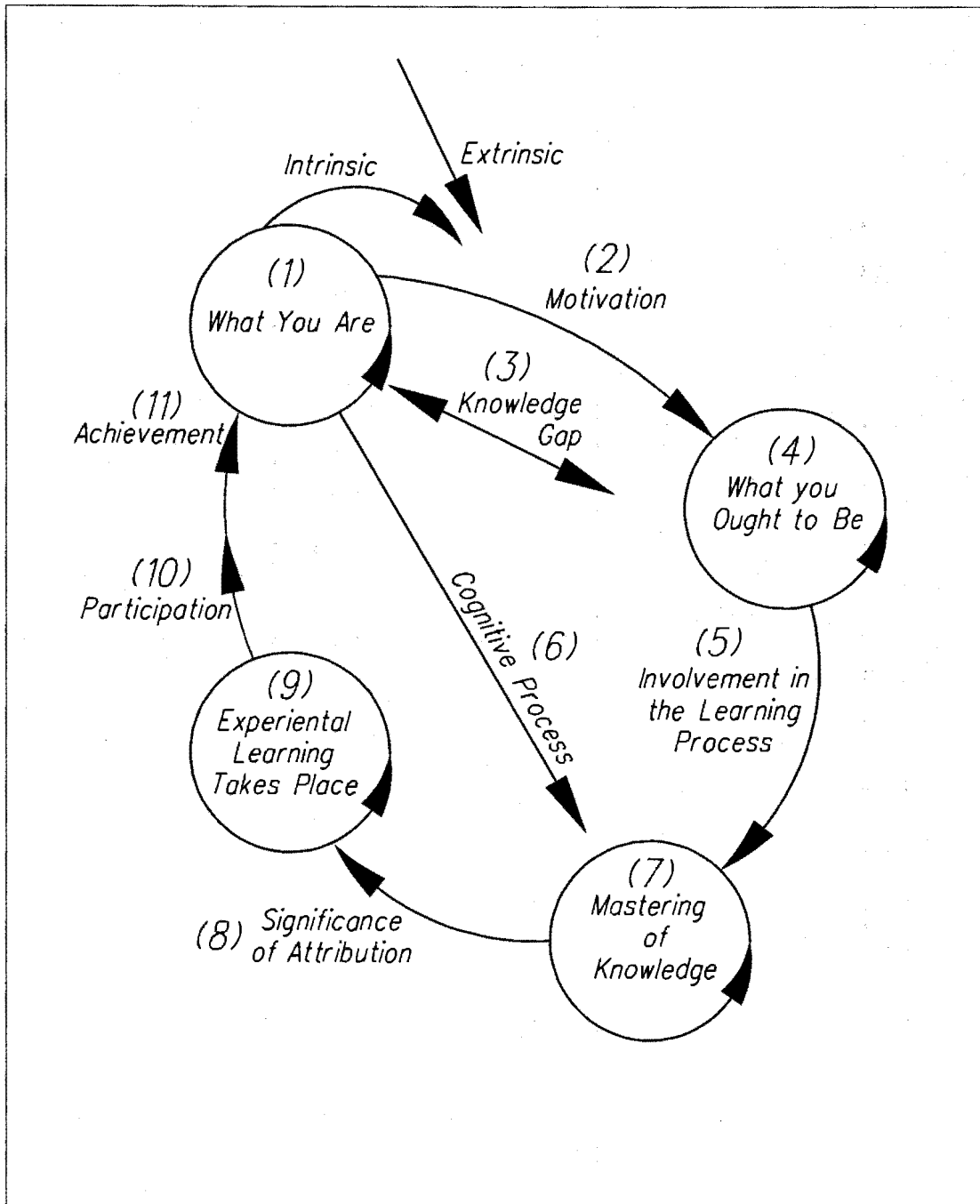
Figure 4. 1 Motivation cycle in the learning process

(Compiled from Monteith 1988:24-25; Oosthuizen 1988:55-56; Petrick & Wiechers 1985:144-149; Quinn 1988:72-76.)

- (10-11) If the attribution of meaning of the subject matter is positive, the student will want to be involved in this situation again, and therefore would want to learn and know more about the subject. The positive level of achievement will contribute to the level of self-concept in such a way that the student will be motivated to become more involved in the subject matter. This positive attribution to herself will motivate the student to move into such a situation again.

Guidance to achieve a positive motivation cycle must be given in order to support a student in the learning and studying process and to promote self-actualisation, especially where the cycle has taken a negative turn.

4.6   LEARNING AND STUDYING

Learning is a comprehensive act which includes studying. When you study, you try to memorise, but when you learn, you memorise in order to master the work. Learning includes studying and the exploration of information with the intention of knowing it.

4.6.1   Learning

Learning is the act of gaining knowledge by studying. It means to commit to memory, to gain by experience or example and to become informed (Collins 1986a:481). The individual explores with the intention of getting to know the study material. It acquires skill to obtain knowledge about something and to have it laid down in the memory. Learning is also described as a relatively permanent change in behaviour or knowledge level. Another entity of learning is that it is the attribution of meaning and significance. When subject matter has meaning for a student, she has learnt it (Petrick & Wiechers 1985:119).

Smit (1988:33-34) explains learning as a personal and individual activity to gain knowledge. By learning, the individual masters the contents given to her. According to Kolb (1984:132) learning is a process whereby development takes place.

4.6.2 Studying

Studying means to apply the mind to the learning or understanding of a subject by for instance reading. It also means to give careful or critical thought to something, or to take a course in a subject as at a college. When you study you try to memorise (Collins 1986a:860). The intentional act in which a person directs herself meaningfully at the subject matter, is called studying. It is a personal endeavour to master the subject matter (Petrick & Wiechers 1985:119). By studying a student learns (Smit 1988:34).

4.7   THIRD YEAR STUDENT

The Faculty of Arts at Unisa considers a student a third year student from the time she enrols for the final course of a major subject (Unisa 1994a:17).

The third year Unisa nursing student is not necessarily in her third year of study. She can also be in her second or fourth year. Students who are already in possession of a post-registration nursing degree, are allowed to do their first and second year level course in one year. Other students sometimes prefer to first complete all the first and second year level courses before commencing with the third year level courses.

It is expected of third year students to perform better than the first and second year students (Weyers 1988:15). However, in an article on the "third year experience", Weyers (1988:16) described the performance of the third year students of the Faculty of Economical and Management Science as extremely poor. Reasons for this were inter alia the following: the possibility that either the standard of the third year is too high or that of the first and second years are too low; the extent of the third year is more because it consists of three papers; or that the workload of the third years is too high.

Schwerdtfeger (1988:18-19) characterised the third year student in two different ways. On the one hand they can be seen as students at the end of their studies with rounded off knowledge of a subject. On the other hand they can be seen as students at the beginning of bigger things and as potential post-basic students. In the Faculty of Arts,

Department of Afrikaans, it is expected of the third year student to be able to have a logical way of thinking and mastering the subject matter (Schwerdtfeger 1988:19). According to Grässer (1988:25) the third year should be seen as a "rounding-off" of the subject.

A third year student can thus be described as a student who is ready to round off the knowledge of the subject and who is preparing to proceed with post-basic studies.

4.8   CONCLUSION

The academic achievement of the Unisa nursing student is of importance in this research project. The examination results of third year Unisa nursing students will be used to determine whether a correlation existed between learning styles and academic achievement.

The aim of this chapter was to explain the meaning of academic achievement and how it can be affected. The importance of a valid, reliable and objective examination must always be a consideration when putting together an examination paper. A variety of questions as discussed is necessary to test the lower as well as the higher cognitive levels of functioning.

Motivation, whether intrinsic or extrinsic motivation, is necessary for learning to take place and to reach a level of achievement. A description of the terms learning and studying explains why learning is more comprehensive than studying.

Third year Unisa nursing students were used as target population in this research project because of their specific characteristics as discussed above.

The following chapter deals with the empirical design of the study. The research population, research instrument and the procedure used for data collection and analysis will be discussed.

■■■

CHAPTER 5

DESIGN OF THE EMPIRICAL STUDY

5.1   INTRODUCTION

The fundamental aim of the study was to describe the learning styles of Unisa nursing students. Learning styles of students comprise a broad spectrum of the teaching-learning process and therefore research on this topic could be of great significance.

The study involves not only a description of the learning styles of these students but also examines its correlation with academic achievement, distance teaching and home language.

Brink and Wood (1988:94) describe the design of a study as a plan for answering the research question or questions. In this chapter an explanation of the proceedings of the empirical study to eventually find answers to the research questions, will be described.

5.2   TYPE OF STUDY

5.2.1   Quantitative versus qualitative research

This study is a quantitative study as the field of study has been delimited, the information is logical deductive, a structured instrument was used, the data will be generalised, numerical data will be used and it will be analysed statistically. An extensive literature review, which is an essential part of quantitative research, was conducted before data collection. The target population and the size was selected in advance. The 920 respondents represented a large sample of the total population of nursing students at

Unisa. All the mentioned characteristics of this study are characteristics of quantitative studies (Brink 1991:15; Uys & Basson 1991:55). However, in this study the cause-effect relationship between phenomena has not been determined.

The type of study (qualitative versus quantitative) is indicated by the type of data collected. Although both approaches can be used, all studies will emphasize one or the other approach.

Brink (1991:14) explains quantitative research as being primarily concerned with testing theory by using a deductive approach and by being outcome orientated. Characteristics of respondents or events are broken down into directly observable parts which are separate from and unaffected by the researcher. According to Brink and Wood (1988:99) quantitative data have numbers and will have numerical value. Polit and Hungler (1993:444) define quantitative analysis as "the manipulation of numerical data through statistical procedures for the purpose of describing phenomena or assessing the magnitude and reliability of relationships among them".

Qualitative research, on the other hand, is concerned with the meaning of the phenomena and experiences which are not readily observable. Qualitative research therefore has a holistic approach without reducing respondents to parts and emphasises understanding the social world as seen by the respondents. In qualitative research theories are developed by using an inductive approach and by being process oriented (Brink 1991:14). According to Brink and Wood (1988:99) qualitative data have names rather than numbers. Qualitative study strives on determining the depth and complexity of a phenomenon (Uys & Basson 1991:55). Polit and Hungler (1993:444) define qualitative analysis as "the organisation and interpretation of non-numerical, narrative data for the purpose of discovering important underlying dimensions and patterns of relationships".

5.2.2 Non-experimental versus experimental research

The approach to this study was non-experimental. Non-experimental research is defined as being research where data is collected to describe various characteristics and conditions, to explain phenomena and test theoretical propositions and to predict the occurrence and significance of phenomena, without introducing any changes or new treatment (Polit & Hungler 1993:140, 441). In experimental research the independent variable can be controlled or manipulated and it randomly assigns subjects to different conditions (Polit & Hungler 1993:436). This research project did not lend itself to an experimental design as the researcher planned to describe certain data and to describe possible correlations between phenomena. It was also not possible to manipulate any one of these phenomena. Non-experimental research has *what* questions, for example what effect learning styles may have on academic achievement. If a research question of this project was a *why* question, for example why learning styles influence academic achievement, the research would have been of an experimental nature (Brink & Wood 1988:96).

Non-experimental research can either be descriptive or 'ex post facto' research. According to Brink and Wood (1988:95) a descriptive study is where data is described in either words, tables, charts or pictures and where data analysis shows statistical or descriptive relationships.

Because the purpose of this study was to assess the learning styles of the Unisa nursing student as well as to determine possible correlations, this research project was of a descriptive correlational nature. The data analysis will describe the learning styles of the respondents according to the Kolb model of experiential learning as well as any correlations between their learning styles and academic achievement, distance teaching and home language.

A descriptive correlational study is designed to observe, describe and document specific characteristics and phenomena of a certain population or portion of a population, and to describe the relationship among phenomena or variables. It is not used to establish a

cause-effect relationship (Polit & Hungler 1991:159; Uys & Basson 1991:51). Correlation does not prove causation, in other words it does not mean that the one phenomenon, being the learning style, has caused the other, being the academic achievement, distance teaching or home language. Therefore, this study could demonstrate functional but not causal correlations between the phenomena (Polit & Hungler 1993:159). Should there have been a cause-effect situation in which the effect is known and the cause is sought, it would have been a retrospective or 'ex post facto' study (Brink & Wood 1988:97).

A descriptive correlational study is often useful in laying the preliminaries for further research. The knowledge of a correlation between certain phenomena, is interesting and could lead to practical applications (Polit & Hungler 1991:182). This research project could lead to practical application in the form of support to the nursing students regarding learning and within the context of their own learning styles. A reason for doing a descriptive correlational study on this topic is to be able to extend the possibilities of support to the nursing students and to help them reach a higher level of academic achievement.

5.3   THE RESEARCH METHOD

The researcher strove to collect data regarding the nursing students' preferred learning styles in a systematic and unprejudiced way. Characteristics and correlations between the phenomena were examined and the opinions and views regarding their nursing studies at Unisa were asked. The survey approach was thus decided to be the most appropriate method for this research project.

The survey approach in research is used to collect data, systematically and without bias, from a certain population or sample to obtain information regarding the prevalence, distribution and interrelations of phenomena within this group, and therefore to examine the characteristics, opinions and views of the specific group. The survey method also allocates numerical values to the non-numerical characteristics of human behaviour in

such a way that the interpretations of these values are generally valid (Polit & Hungler 1993:148, 447; Uys & Basson 1991:50-51).

Other approaches in research are case studies and historical research. Although case studies are described as being in-depth investigations of a person's behaviour and characteristics, this approach was not suitable for this research project. As case studies are studies where a limited number of people are investigated, the basis for generalisation is questionable because the dynamics of one person's functioning only bears limited resemblance to those of other people (Polit & Hungler 1993:150).

In historical research a critical evaluation of the systematically collected data is done and then related to past occurrences. Although the data of the academic achievement, being examination results of the respondents, is historical, in other words that of the previous academic year, this study cannot be seen as a historical study. In a historical study people are asked to recall events and memories from the past which may shed light on present behaviour or practices. Past human behaviour is therefore identified (Brink & Wood 1988:97; Polit & Hungler 1993:150, 437). The learning styles of the respondents are not past experiences but still exist.

According to Polit and Hungler (1991:144) most descriptive research projects proceed without an absolute hypothesis and are guided by research questions. Although certain relationships were investigated in this study, the outcome could not be anticipated. Polit and Hungler (1991:147) are quoted in this regard.

> *Descriptive research, which focuses on a depiction of the status quo of some situation rather than on explanation, often proceeds without a hypothesis.*

An important aspect of research is that it has to be logic and objective. To formulate a hypothesis regarding the correlation between the learning styles and the examination results of the respondents in this research project, may be seen as being subjective (Uys

& Basson 1991:6). This research project was therefore guided by research questions as presented in the first chapter, section 1.3.

5.4   THE TARGET POPULATION

The target population was comprised of all students who were registered for a third year course in the Department of Nursing Science during 1993, in other words those students who were registered for the subjects Nursing Education, Nursing Administration, Community Health Nursing Science and/or Ethos and Professional Practice. Reasons for including these students in the research project, have already been discussed in the previous chapters.

The respondents included all those students who registered for the above subject or subjects at the beginning of 1993. All the respondents did not necessarily write the examination at the end of the year, and therefore could not be included in the comparative element of the research project where the examination results were used. However, the information on their learning styles is still important as motivation for study and reasons for not writing the examination can also contribute to research on learning styles.

5.4.1   Information on the target population

Because Unisa's student records are computerised, the names of the relevant students could be obtained from the university records. The information on these students is of a historical nature, and therefore it was possible to obtain all the information regarding the 1993 examination at the same time.

Information on the target population was obtained with the help of the Department of Computer Services at Unisa. A computer programme which withdraws information of

students according to subjects they are or were registered for, was used to compile a computer list of the target population.

The computer list included the following information:

- student number of the person;

- name and address;

- language of correspondence;

- code of subject or subjects;

- examination results, and

- codes explaining the examination results. These codes indicate whether the student passed, passed with distinction, failed, was absent from the examination, was granted a supplementary examination, was not admitted to the examination, withdrew voluntarily from the examination, passed on average, was suspended because of disciplinary reasons, or cancelled her registration.

5.4.2 Size of the target population

The computer list which was compiled according to the four subjects gave the size of the population as 1538, of which 291 students were registered for one, 607 students were registered for two, and eleven students were registered for three of the relevant subjects. All the students registered for more than one subject had to be identified. With the help of the computer all duplicate student numbers were extracted, which prevented one student receiving two or three questionnaires. Questionnaires were mailed to 909 respondents. The target population participating in the research project thus was 909.

The size of the target population is explained in **Tables 5.1** and **5.2** below.

Table 5. 1 Number of population (N=1538)

Course Code	CNU	NUA	NUE	NEP	TOTAL
Number of students	597	501	414	26	1538

Table 5. 2 Number of target population (N=909)

Number of subjects	Number of students respondents			
	Subject	Subject	Subject	Total
One	291	-	-	291
Two	607	607	-	1214
Three	11	11	11	33
Total	909	618	11	1538

The researcher saw 909 as a manageable number and therefore included the whole population, and not only a sample, in the investigation.

Researchers are generally advised to use the largest sample possible. A large sample maximises the validity of the generalisation of the results. When the response is anticipated to be poor, as in the case of mailed questionnaires, the sampling size should be as large as possible. By including a large number of respondents, the problem of poor response to mailed questionnaires should not have a negative effect on the validity

of the generalisation of the results of the research project (Brink & Wood 1988:131; Polit & Hungler 1993:184; Uys & Basson 1991:95; Woods & Catanzaro 1988:211).

Another reason for including the total population was to exclude any bias regarding aspects like cultural background, home language or personal conditions. Although financial considerations as well as time available to the researcher was also of concern, the most important consideration in this research project, was the endresult.

5.5 THE RESEARCH INSTRUMENT

To obtain information from the respondents in a survey, different methods can be used, namely a face-to-face interview, which is the most powerful method, telephone interviews and questionnaires which can either be handed to the respondent or mailed (Polit & Hungler 1993:148; Uys & Basson 1991:52).

5.5.1 Type of instrument

The target population was scattered over a vast area, which included Southern Africa, Namibia, Zimbabwe, Zambia, Canada and the United States of America. Although the face-to-face interview is described as being the most powerful instrument for a survey, only a fairly small sample, which would not have been representative of the target population, would have been included if a face-to-face interview was used to obtain the data. The mailed questionnaire was therefore the method of choice.

Advantages of the mailed questionnaire include the following. The questionnaire is less expensive in terms of time spent collecting the data, a large number of people can be included simultaneously and a wide geographic area can be covered. Because the format of the questionnaire is standard from one respondent to the next, it is not susceptible to changes in emphasis. The absence of the researcher also ensures that there will be no bias in the responses that reflect the respondent's reaction to the researcher rather than

to the questions (Brink & Wood 1988:146-147; Polit & Hungler 1993:205; Woods & Catanzaro 1988:302).

Although the respondents in this research project were not anonymous, they did not have to give their opinions, feelings, thoughts and experiences directly to an interviewer. The inclusion of these types of questions thus made the mailed questionnaire a suitable method of data collection. There was also no pressure of giving an immediate answer to the questions as in an interview. Because the answers could be given at the respondents' leisure, they had the opportunity to think their answers over.

In questionnaires, responses are limited to answers to predetermined questions and there is no opportunity to collect nonverbal data. This can be seen as a disadvantage but also as an advantage. The advantage is that it excludes subjective interpretation of the nonverbal message and the disadvantage is that the nonverbal reaction of the respondent in terms of the level of comfort with and the understanding of questions cannot be evaluated (Woods & Catanzaro 1988:303).

The researcher was well aware of the limitations of the mailed questionnaire in terms of the response rate. The presence of country wide strikes, including at hospitals and post offices, could also be seen as a problem in expecting a good response. Strikes at post offices, especially in the previous Bophuthatswana, Transkei and Venda could cause either a delay in the postage or respondents not receiving the questionnaires at all (Liebenberg 1994:8; Peters 1994:7; Rantao 1994:3). However, the researcher saw the inclusion of a representative target population as essential for this research project. The only way to reach this target population was through a mailed questionnaire. As this research project is eventually aimed at helping the students reach higher academic achievement, it was hoped that the respondents would see the importance and relevance of completing and returning the questionnaire. As Rix (1983:62) said, "the success of a questionnaire depends upon the respondent's willingness to communicate".

5.5.2 Designing the research instrument

Numerous research and literature sources were used to base the items of the questionnaire on. Items relevant to the research project were then drafted and put in a meaningful order.

The questionnaire consisted mainly of close-ended questions. One open-ended questions was included. Some of the close-ended questions were provided with fixed sets of responses, for instance item 1.11. In many of the close-ended questions open-ended responses were included, for instance item 1.3. The open-ended question gave the respondents the opportunity to express feeling, thoughts and experiences.

According to Woods and Catanzaro (1988:308) close-ended questions are appropriate for survey research. The close-ended questions are easy to code and provide a regularity of measurement with greater reliability of responses. A disadvantage of close-ended questions however, is that they do not examine beneath the surface of the response and may cause the respondents to feel that they are being forced to select one of the alternatives. In this research instrument many of the close-ended questions gave the respondents the opportunity of including a personal response.

The open-ended question in this instrument was included because the researcher could not anticipate the response to such a question. No restraint was therefore placed on the way in which the respondents would/could answer the question.

The research instrument consisted of questions regarding the demographical characteristics and information about the environment of the respondents, their affective experiences and motivation during their study years and questions regarding their learning styles.

Many questionnaires determining or examining learning styles exist. After an extensive literature study, the researcher found the Learning Style Questionnaire, designed by Marshall and Merritt, to be the most valid and reliable questionnaire as well as the most applicable to the research project. It was decided to use this existing questionnaire as part of the research instrument. A discussion on the Marshall and Merritt Learning Style Questionnaire was given in chapter 2, section 2.7.

The research instrument consisted of two sections, of which section one was designed by the researcher and section two was comprised of the Marshall and Merritt Learning Style Questionnaire.

At the end of the questionnaire, the respondents were thanked for their contribution and again assured of confidentiality.

5.5.2.1 Section one

Personal questions like age, home language or ethnicity, education and questions on family matters, play an important explanatory role and have been shown to be related to a person's behaviour and habits (Polit & Hungler 1991:192). This information is thus necessary to analyse the nursing student in terms of the objectives of the research project. Knowledge of the demographical information of the target population can also be used to compare their characteristics with other groups of nursing students, both in this country and abroad. As questions on race and ethnicity are a sensitive issue in this country, only the home language of the respondent was asked. This information would enable the researcher to identify whether the preferred language of correspondence with the university was their home language or second or third language. It would also indicate whether the respondent came from a Western or Black culture, as culture also has an effect on learning styles. The information on the respondent's ethnical group is available on the student records of the university, should the researcher find it necessary to use in the data analysis.

Questions on the working environment and situation of the respondent were included to determine if there were any work-related aspects which possibly influenced the learning and study situation they are in.

Information regarding the academic profile of the respondent was obtained by asking questions about their qualifications, academic history, preferred teaching method, study pattern and professional or personal activities which could influence their study programme.

To determine the level of motivation, three close-ended questions were asked, as this could lead the researcher to the reasons why the students learned or behaved in a certain way. Two of these questions also gave the respondents the opportunity of giving an open-ended response.

Questions that were psychological in nature, were included in areas of inquiry relating to the affective domain of human experience. These were either close-ended questions with the opportunity of an open-ended response or open-ended questions to enable the respondents to explain opinions, attitudes and values.

All the questions asked in section one were believed to be significant in terms of the objectives of this research project.

5.5.2.2 Section two

Section two consisted of the existing Marshall and Merritt Learning Style Questionnaire. Permission to use this questionnaire as part of a research project was given by Marshall and Merritt. (See Appendix A)

Reliability and validity studies were carried out on the questionnaire by the researchers Marshall and Merritt (1986:257). However, all the research projects using this questionnaire, were conducted in other countries. This research project is, to the researcher's knowledge, the first in which the Marshall and Merritt Learning Style Questionnaire has been used in research on learning styles of nursing students in this country. The validity and reliability of the Marshall and Merritt Learning Style Questionnaire will be tested again during the data analysis.

The purpose of this section of the questionnaire was to classify the learning styles of Unisa nursing students according to the Kolb model of experiential learning.

5.5.2.3 Translation of the research instrument

The questionnaire was compiled in English and thereafter translated into Afrikaans, as the target population consisted of both English and Afrikaans respondents.

The existing Marshall and Merritt Learning Style Questionnaire, is in English. Special attention was given to the translation into Afrikaans. Both English and Afrikaans dictionaries and thesauruses were used. The translated version was edited by an expert editor, who was highly recommended.

5.5.2.4 Covering letter

The covering letter was compiled with considerable circumspection. The researcher was well aware of the possibility of a poor response rate and tried to emphasise the importance of the respondents' contribution to the research project. It was also hoped that the respondents would see the research project as a form of help to them as students, of whom a great number are generally described as being underprivileged and educationally deprived students. Special attention was paid to motivating participation. The reason for them being part of the target population was also explained. Although the

student number of the respondent was indicated on the questionnaire, strict confidentiality was assured.

Although no indication was given of the time it would take to complete the questionnaire, a fairly short response time was asked of the respondents, in an attempt to prevent the questionnaire from being forgotten. A stamped, addressed return envelope was provided with the questionnaire.

The telephone number of the researcher was included and the respondents were invited to contact her in any case of uncertainty when completing the questionnaire.

5.5.2.5 Pilot study

Both the English and Afrikaans questionnaires were pretested.

Before the research instrument was pretested, it was submitted to a statistician as well as fellow colleagues with experience in compiling questionnaires for evaluation. Suggested changes were made, mostly regarding the technical outlay of the questions. Questions where the respondents would have the opportunity of expressing thoughts and feelings, were also altered on advice.

The pilot study was conducted to establish whether the instructions and the questions were clear. The sample used for the pilot study included 15 students who were registered for a third year subject in the Department of Nursing Science during 1994. Special attention was given to prevent any student from being part of both the pilot study and the actual research project.

The covering letter accompanied the questionnaire to ensure that the respondents in the pilot study were aware that the student number would be attached to the questionnaire. It took the respondents between ten and twenty minutes to complete the questionnaire.

After completion, an interview was conducted with each of the respondents participating in the pilot study. None of the respondents was dissatisfied or uncomfortable with the inclusion of their student numbers in the questionnaire. The explanation in the letter and the assurance of confidentiality satisfied the respondents. Each item was discussed with the respondents individually. Only one item was not clear. No items were incorrectly interpreted. No items made them feel uncomfortable or that they might suffer emotional harm or discomfort. Five of the respondents suggested that an example of how to answer section two be included to illustrate the directions for answering this section.

5.5.2.6 Final preparation of the research instrument

The wording of item 1.8 was changed for the sake of clarity. An example of how section two should be completed, was included as part of the directions for this section. No adjustments were made to the Marshall and Merritt Learning Style Questionnaire.

After the questionnaire was analysed by experienced researchers within the university, by peers and during the pilot study, the questionnaire was finally refined.

The complete English and Afrikaans questionnaires are contained in Appendix B.

5.6   DATA COLLECTION

The plan for actually implementing the data collection, must be made in such a way as to minimize biases or distortions.

5.6.1 Approval for the study

When the researcher enrolled for the MA(Cur) degree, the research proposal was approved by the university. Unisa therefore approved of this research project and holds copyright to the research findings. No further permission was thus needed as all respondents were or are still students of this university.

5.6.2 Ethical considerations

Voluntary participation in a research study, is one of the key principles of ethical conduct (Polit & Hungler 1993:359). The covering letter of the questionnaire indicated that participation in this project was voluntary. It also included information regarding the research project and allowed the respondents the power of free choice, enabling them to either participate voluntarily or decline participation. By answering and returning the identified questionnaires, the respondents therefore signified permission to be part of this research project.

Although the student number of the respondent was disclosed on the questionnaire, the participant was assured of confidentiality. Complete anonymity of the respondents was not possible, as examination results were being used in the correlational component of the research project. The information would however not disadvantage the respondent in any event. All the respondents are protected from public disclosure and were guaranteed confidentiality in the covering letter and in a statement at the end of the questionnaire. No information will be reported by identifying the respondents. The researcher will strictly honour the confidentiality.

5.6.3 Costs of participation

No monetary costs were expected of the respondents as a correct-size stamped return envelope was included with the questionnaire. Costs of participating in a research project also include the time to complete the questionnaire. No average amount of time to

complete the questionnaire was given. The estimation of time needed to complete the questionnaire could be based on the appearance of the questionnaire. It was fairly thin in size, the items were well-spaced, the print was of a comfortable size, no complex response alternatives were used and therefore the format and layout decreased the personal costs.

5.6.4   Distribution of the instrument

Name and address stickers and stickers containing only the student number were provided by the Department of Computer Services. The questionnaire was printed on an A4 sheet on both sides, to reduce the thickness. The pages were attached along the side like a booklet to ease the paging and completion. After identifying the questionnaire with a sticker containing the student number and including the franked return envelope, it was mailed to the respondents during the first week of August 1994.

By the beginning of September 1994, approximately five weeks after the first questionnaire had been posted, 359 questionnaires had been received back.

Reminders (see Appendix C) as well as second questionnaires were posted to the 550 respondents who had not yet responded. Because the questionnaires were identified with the student numbers, no respondent who had already returned the questionnaire, received a second one.

The decision to include a second questionnaire with the reminder was made on the following grounds. Countrywide problems with the postage because of strikes could have caused the respondents not to have received the first questionnaire. It was also possible that the original questionnaire was misplaced or discarded.

5.7 RESPONSE TO THE INSTRUMENT

[handwritten annotation: Very enthusiastic – hundred, hundred of ... ... approach]

All questionnaires received by the first week of November 1994, three months after the original questionnaire had been posted, were included.

There were 359 students who returned the first questionnaire and 141 students returned the second questionnaire. Apart from these, two questionnaires which were not useable, were also returned. The total number of useable questionnaires returned to the researcher was 500 (55 percent). The response to the questionnaire was fairly high considering that mailed questionnaires often have a weak response. The postal service strikes were also a matter of concern, but did not seem to have a negative impact on the response rate.

The other two questionnaires which were returned, were discounted. One respondent felt that one week to complete the questionnaire, was too short. The other questionnaire was returned by a family member who commented that the respondent was temporarily overseas. No forwarding address could be given.

Various students reacted to the invitation in the covering letter to phone the researcher in case of uncertainties. From the conversations it was apparent that the personal contact with the researcher was the main reason for phoning. No significant questions or problems were mentioned. *[handwritten annotation]*

5.8 CODING OF DATA AND DATA REPRESENTATION

The researcher coded all the items of the questionnaires. The data capture was done on a computerised database.

As the student number was used as record number, no duplication was possible where respondents had returned two questionnaires. It was however coded in such a way that the number of respondents returning the second questionnaire could be established.

5.9   DATA ANALYSIS

The statistical analysis of the questionnaire was done with the assistance of a statistician. A computer programme called the Statistical Analysis System (SAS), version 6.09 was used to process the coded data of the returned questionnaires.

5.10   CONCLUSION

In this chapter the design of the empirical study is described. The research project was a quantitative, non-experimental study. The survey approach was used to collect the data in the form of a mailed questionnaire. A description of the research instrument, which partially consisted of an existing questionnaire, was given. Specific considerations in the data collection were discussed. The returned questionnaires were coded and then analysed.

In the following chapter the results and findings of the first section of the questionnaire are discussed.

■ ■ ■

CHAPTER 6

ANALYSIS AND DESCRIPTION OF RESPONDENTS

6.1   INTRODUCTION

Demographic and educational information was obtained to describe the respondents in terms of the research objectives. The information was also gathered to serve as a basis for the analysis of the second section of the questionnaire.

In this chapter the data obtained in the first section of the questionnaire is discussed. Frequency tables and figures are used to illustrate the findings. The discussion will include the following information:

- Demographic profile

- Academic profile

- Level of motivation of respondents

It will be noted that the number of respondents who completed a specific item differs. Of the 500 respondents who returned their questionnaires, not all supplied information for all the items. The number of respondents who completed an item, will be given and percentages will be calculated accordingly.

6.2   DEMOGRAPHIC PROFILE

6.2.1   Respondents' age

- Item 1.1

Table 6. 1   Age distribution respondents (N=480)

Ages	f	%
25 - 29	17	3.5
30 - 39	239	49.8
40 - 49	164	34.2
50 - 59	57	11.9
60 - 61	3	0.6
Total	480	100.0

Table 6.1 provides the age distribution of the respondents. The ages ranged from 25 to 61 years old. The mean age was 40.26 with a standard deviation of 7.2. From this table it can be seen that approximately 50 percent of the 480 respondents who completed this item, were between 30 and 39 years of age. Of the 500 respondents returning their questionnaires, 20 did not indicate their age. The largest single group of respondents (36, 7.5 percent) fell in the 37 year age bracket.

When comparing the age of the respondents to the statistics included in the student profile for 1994 as compiled by the Bureau for Management Information, University of South Africa, the mean age (40.26) of the respondents participating in this research project was higher than the mean age (36.67) given in the 1994 statistics as described in section 3.5.1.1 of chapter 3. The difference is probably due to the fact that the respondents of this research project were all third year students in 1993 and therefore

have been Unisa students for a number of years, whereas the statistics compiled by the Bureau for Management Information, University of South Africa, included all Unisa nursing students from their first year onwards.

It is also interesting to note that 12.5 percent (60) of the respondents were between the ages of 50 and 61, with three respondents between 60 and 61 years old. These are fairly high ages for a student. According to the student profile for 1994, only 4.64 percent of the student population was 50 years of age and older, with nine students being 60 years old or older (Unisa 1994b:1).

The mean age of 40.26 substantiates the description of the Unisa nursing student as being a non-traditional student. Findings of research studies did not support the proposition that age is an indicator for differences in the way that adults prefer to learn. It does however suggest that the older non-traditional students need to be assisted in orienting themselves to the learning situation (Merritt 1983:372). (Refer to chapter 3, section 3.5.)

6.2.2   Home language

- Item 1.2

In **Figure 6.1** the distribution of the home languages of the respondents is indicated. The majority (18.7 percent, 91) of the 487 respondents who completed the item, were Zulu speaking, with the Xhosa and Afrikaans speaking students (both 17 percent, 83 respondents) in the second position. Of the 500 respondents 13 did not indicate what their home language was.

Of the respondents 3.3 percent (16) indicated their home language as 'other'. 'Other' included languages like Shona, Ndonga, Oshiwambo, Hindi, Hindustani, Kwanyama, Tamil and Telegu, which are not official South African languages.
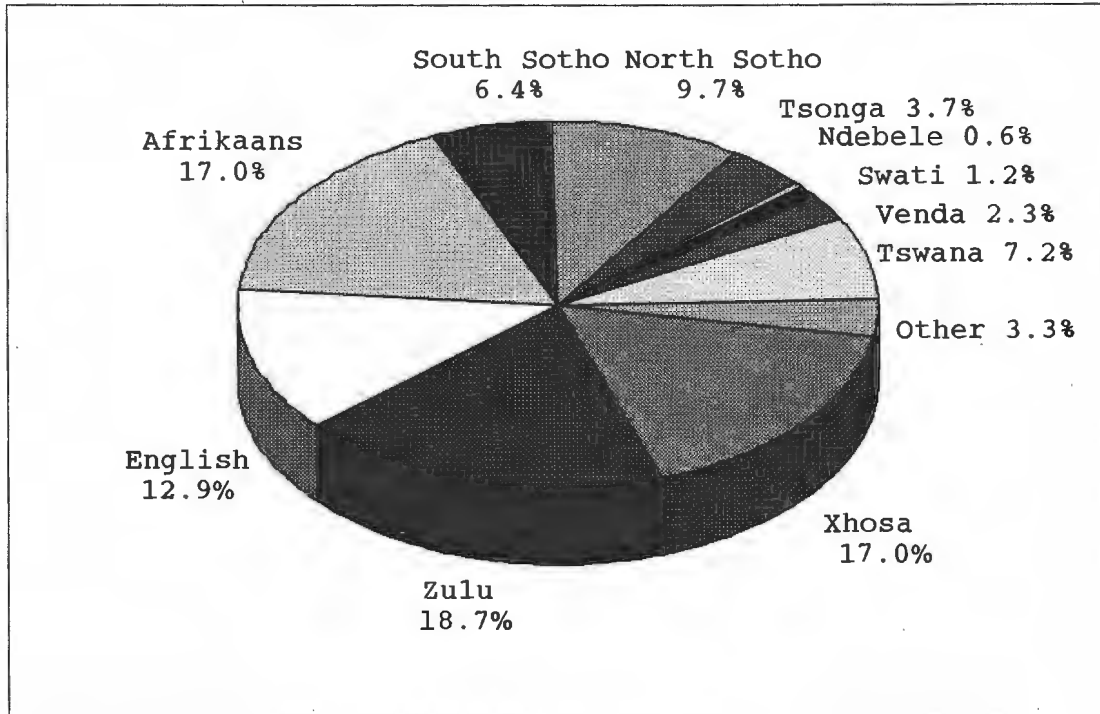
Figure 6. 1 Respondents' home language (N=487)

Excluding all respondents who indicated their home language to be English, Afrikaans or 'other', the majority (66.7 percent, 325) of the respondents have a Black language as home language. Although a certain number of the 'other' languages are also Black languages, those numbers were not specified. Only the official South African languages were specified.

The findings indicate that the majority (70 percent, 341) of the respondents study in a language other than their home language. Only 30 percent (146) of the respondents indicated their home language to be either English or Afrikaans.

When these statistics are compared to the statistics of the student profile for 1994, compiled by the Bureau for Management Information, University of South Africa, as described in section 3.5.1.3 of chapter 3, the following comparisons can be made. Both statistical analyses indicate that the majority of Unisa nursing students are students with a home language other than the two official languages used at Unisa. According to the student profile for 1994, the Xhosa speaking students (18.42 percent) were the majority, followed by the Zulu speaking students (17.28 percent) (Unisa 1994b:1).

Figure 6.1 shows that 17 percent (83) of the respondents were Afrikaans speaking. This percentage of Afrikaans speaking respondents was higher than the statistics of the student profile for 1994 where the Afrikaans speaking students constituted 11.59 percent of the respondents (Unisa 1994b:1). The student profile for 1994 included all the Unisa nursing students, also the newcomers, and it therefore shows that less new Afrikaans speaking students register for a course in Nursing Science at Unisa. This difference indicates an ongoing decrease in the number of Afrikaans speaking nursing students.

Only a slight difference is noted in the percentage of English speaking students. From **Figure 6.1** it can be seen that 12.9 percent of the respondents were English speaking, compared to the 10.75 percent English speaking students indicated in the statistics of the student profile for 1994 (Unisa 1994b:1).

It therefore seems that an increasing number of Unisa nursing students have a home language other than one of the official languages used at Unisa.

6.2.3 Employment status

- Items 1.3 -1.5

The respondents were asked to complete these items which described their employment

status with regard to employment positions (**Table 6.2**), working hours (**Table 6.3**) and whether they work full-time or part-time (**Figure 6.2**).

Table 6. 2 Employment positions (N=487)

Post	f	%
Professional Nurse	348	71.5
Nurse Educator	66	13.6
Nursing service manager or senior manager	62	12.7
Full time student	2	0.4
Non-nursing post	6	1.2
Retired	3	0.6
Total	487	100.0

Table 6.2 shows that the majority of the 487 respondents (71.5 percent, 348) who completed item 1.3, worked as professional nurses. Those respondents who indicated that they were senior professional nurses, were also included in this group. Respondents who held posts as nurse educators included 13.6 percent (66 respondents) and those who were in managerial positions 12.7 percent (62 respondents). Of the respondents 0.4 percent (two) indicated that they were full-time students, 1.2 percent (six) were in non-nursing positions, which included posts like work-study officers and training officers, and 0.6 percent (three) of the respondents were retired. The majority (97.8 percent) held posts in the field of nursing, which correlates with the statistics of the student profile for 1994, as discussed in section 3.5.1.7 of chapter 3.

In item 1.4 the respondents had to point out whether they worked full-time or not. From **Figure 6.2** it is clear that most of the 482 respondents (96.9 percent, 467) who answered the question, worked full-time.
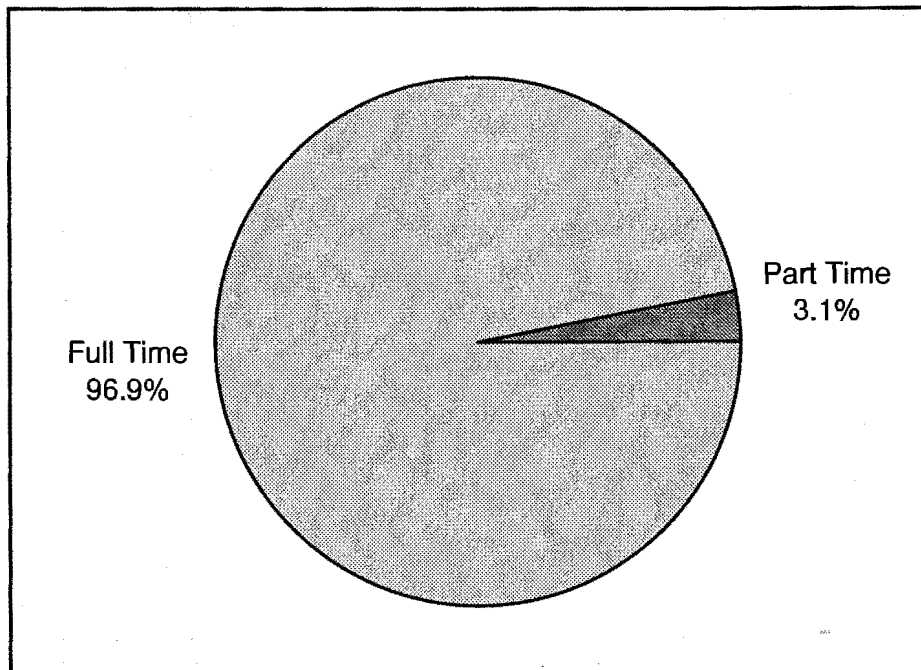
Figure 6. 2 Full-time or part-time positions (N=482)

In item 1.5 the respondents had to point out their working hours (see **Table 6.3**). Only 37.1 percent (179) of the 482 respondents indicated that they worked regular office hours. All the other respondents (62.9 percent, 303) indicated their working hours to be irregular shifts, flexitime, day and night duty (including weekends), which are all seen in general as unusual or unsociable hours.

Table 6. 3 Working hours of respondents (N=482)

Working Hours	f	%
Office hours	179	37.1
Day duty	108	22.4
Night duty	12	2.5
Day and night duty	128	26.6
Irregular shifts	55	11.4
Total	482	100.0

An important conclusion made is that the majority of Unisa nursing students cannot study according to a rigid study programme, and will need specific support and help in planning their study time according to their unique working hours.

6.3 ACADEMIC PROFILE

6.3.1 Registration with the South African Nursing Council

- Item 1.6

The respondents were asked to indicate their registration with the South African Nursing Council. No distinction was made between the respondents who obtained their nursing qualifications through a degree and those who obtained them through a diploma course.

Of the 500 respondents 488 completed the item. Because of the specific requirements for entering the Unisa nursing courses, all the respondents were at least registered as either general or psychiatric nurses. (Refer to section 3.3 of chapter 3 in this regard.)

Figure 6.3 displays the nursing qualifications of the respondents. Respondents in possession of a qualification as general nurse, represented 99.6 percent (486) of the respondents. The other 0.4 percent (two respondents) were those who were only registered as psychiatric nurses. The latter group probably represented those respondents who qualified many years ago when it was still common for nurses to qualify in one branch of nursing (such as psychiatric nursing) only.

From the data available in **Figure 6.3** it is satisfying to observe that 97.1 percent (474 respondents) had the midwifery qualification. Only 2.9 percent (14 respondents), including the 0.4 percent (two respondents) who only had psychiatric nursing as basic

qualification, were not qualified midwives. In Brownlee's study (1982:246) only 16 of 501 respondents (3.2 percent) and in Paton's study (1988:75) only five of 370 respondents (1.4 percent) were not in possession of the midwifery qualification.
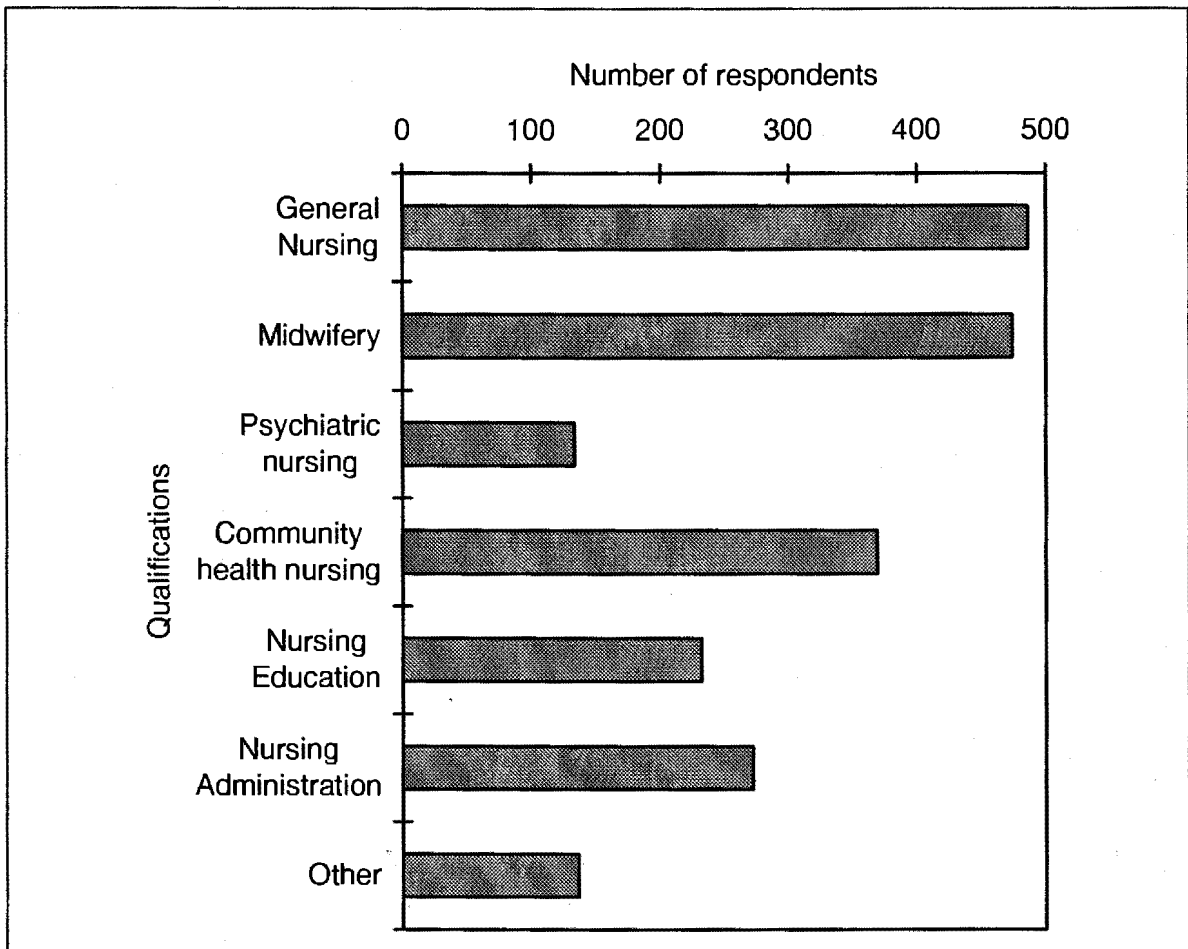
Figure 6. 3 Nursing qualifications of respondents (N=488)

Another feature of **Figure 6.3** is the low percentage of respondents who were trained psychiatric nurses. Only 27.3 percent (133) respondents held this qualification. This feature was also identified in Brownlee's study (1982:246), where only 20.3 percent (102) of the 501 respondents held this qualification.

Table 6. 4 Registrations held by the respondents (N=488)

Qualifications	f	%
General Nurse	9	1.8
Psychiatric Nurse	2	0.4
General Nurse and Midwife	57	11.7
General and Psychiatric Nurse	-	-
General and Psychiatric Nurse and Midwife	16	3.3
General, Psychiatric and Community health Nurse and Midwife	107	21.9
Community health Nurse, Nurse Educator, Nurse Administrator and other qualification	297	60.9
Total	488	100.0

Table 6.4 sets out the data of the registrations held by the respondents. Of the 486 respondents (99.6 percent) who were qualified as general nurses, nine respondents were in possession of this single qualification only.

Respondents who only held a single nursing qualification, represent 2.4 percent (11 respondents). Those qualified as general nurses and midwives, represent 11.7 percent (57 respondents), those qualified as general and psychiatric nurses and midwives 3.3 percent (16 respondents), those qualified as general, psychiatric and community health nurses and midwives 21.9 percent (107 respondents). None (0 percent) of the respondents were qualified as only general and psychiatric nurses.

Changes in nursing education will explain why only such a very small percentage of the respondents were nurses with single qualifications. Young or newly qualified nurses with a single qualification will probably be those enrolled nurses who did the bridging course

leading to registration as a general nurse or psychiatric nurse. In April 1986 it also became compulsory for all students registering for the first time to train for registration as a nurse, to register for the comprehensive course which leads to registration as a general, psychiatric and community health nurse and midwife (Mellish & Brink 1990:48). These changes brought about the acceptance that general, psychiatric and community health nursing and midwifery are the basic nursing registrations. Paton's study (1988:75) indicated that 25.1 percent of the 370 respondents were in possession of these basic qualifications.

It is interesting to note that, in spite of the changes, the percentage of respondents qualified for the basic nursing registrations, as mentioned above, did not increase since Paton's study was completed in 1988. The percentage however could have been influenced by the fact that only a small percentage (27.3 percent) of the respondents were qualified psychiatric nurses.

When viewing **Figure 6.3** it is noted that a fairly great number of respondents were registered in Community health nursing (75.6 percent, 369 respondents), Nursing education (47.5 percent, 232 respondents) or Nursing administration (55.7 percent, 272 respondents) with the South African Nursing Council. It should be kept in mind that the respondents were third year nursing students in 1993 which means that a number of them completed their Unisa nursing course at the end of that year (1993). However, all the respondents did not necessarily obtain the qualifications after completion of the Unisa nursing course. A certain number of these qualifications could have been obtained at another tertiary institution or after completion of another Unisa nursing course.

Of the 488 respondents, 27.9 percent (136 respondents) had nursing qualifications other than the basic nursing qualifications as mentioned above or those obtainable through a Unisa nursing course. These qualifications included the clinical post-basic specialisation courses (for example orthopaedic nursing, paediatric nursing, intensive care nursing and operating theatre nursing) and other nursing courses like family planning, primary health care, occupational health nursing, stomatherapy and ward administration.

From the above, it seems that there is a trend for a fair number of Unisa nursing students to strive to develop themselves as well-qualified practitioners. This trend reinforces the discussion of the profile of the Unisa nursing student as a well-qualified practitioner that was presented in sections 3.4 and 3.5 of chapter 3.

6.3.2 Information related to their studies after school

The data obtained from items 1.7-1.9 which are illustrated in **Tables 6.5, 6.6** and **6.7** should be considered together.

- Item 1.7

Table 6. 5 Year in which respondents qualified as registered nurses (N=483)

Year qualified as registered Nurse	*f*	%
1956 - 1959	7	1.5
1960 - 1969	60	12.4
1970 - 1979	165	34.1
1980 - 1989	249	51.6
1990 ->	2	0.4
Total	483	100.0

In item 1.7 the respondents were asked to indicate the year in which they qualified as registered nurses. Of the 500 respondents 483 answered the question. From **Table 6.5** it can be seen that 52 percent (251) of the respondents qualified from 1980 onwards, 34.1 percent (165) qualified between 1970 and 1979 and only 13.9 percent (67) before 1970.

• Item 1.8

Table 6. 6 Years of interruption during study years (N=431)

Years of interruption	f	%
0 - 5	257	59.6
6 - 10	119	27.6
11 ->	55	12.8
Total	431	100.0

In item 1.8 the respondents were asked to indicate the number of years they did not study after qualifying as a registered nurse. **Table 6.6** shows that of the 431 respondents who answered the question, 59.6 percent (257) had five years or less interruption during their study years after school, 27.6 percent (119) had between six and ten years of interruption and only 12.8 percent (55) had more than ten years of interruption.

• Item 1.9

Table 6. 7 Study years after school (N=448)

Study years after school	f	%
1 - 5	94	21.0
6 - 10	161	35.9
11 - 15	161	35.9
16 - 20	19	4.3
21 ->	13	2.9
Total	448	100.0

In item 1.9 the respondents were asked to indicate the number of study years after school. Considering that the respondents used in this research project were third year

post-basic students, they should have had at least six years of study after school. However, 21 percent (94) of the 448 respondents who completed the item, indicated their study years after school to be five study years or less. The possibility therefore exists that the question was not understood correctly or was not formulated well enough.

According to the statistical data shown in **Table 6.7**, 35.9 percent (161) of the respondents had between six and ten years, 35.9 percent (161) had between 11 and 15 years and 7.2 percent (32) had 16 years and more study experience after school. The majority of the respondents (79 percent, 354) had six years or more experience as a student.

Of the 500 respondents 10.4 percent (52) did not complete item 1.9. Taking in consideration also the 21 percent (94) of the 448 respondents who probably completed the item incorrectly, it seems that there could have been a problem with the interpretation of this item.

From **Table 6.5** it can be seen that more than half of the respondents qualified in the past ten to fifteen years. It seems that the majority of the respondents were practitioners with specific needs for continuing education. This diversion links with Brownlee's description (1982:202) that the nursing students are highly motivated to improve their academic qualifications.

When taking into consideration that 52 percent of 483 respondents qualified as registered nurses from 1980 onwards (vide **Table 6.5**), that the respondents can be described as fairly well qualified nurses (vide **Figure 6.3** and **Table 6.4**), as well as the fact that 79 percent of 448 respondents had six or more study years experience after school (vide **Table 6.7**), it is understandable why the majority of the respondents have not had many years of interruption in the study years after school (vide **Table 6.6**). It is thus seen as reasonable to describe the respondents as experienced learners. These

statistics also support the description of the Unisa nursing student as an experienced learner, as discussed in section 3.5 of chapter 3.

In a research study undertaken by Nelson (1979:25, 38) students expressed concern that they might not be able to complete a course successfully because of a long break after previous study. Unfortunately, the number of years that had elapsed after previous studies was not indicated in the report. These students were then helped regarding study skills and approaches to studying, with great success.

Although the Unisa nursing students are described as experienced learners and although the majority of the respondents had a fairly short interval between their courses and should be in a pattern of learning and studying, it does not mean that the students do not have a need for support in the learning process.

6.3.3 Unisa method of tuition

• Item 1.10

In item 1.10 a question was asked to establish whether the respondents studied through a preferred method of tuition. The respondents were also asked to comment on their answer.

Figure 6.4 indicates the preference the respondents had for the Unisa method of tuition. Of the 471 respondents who answered the question, a high 81.1 percent (382 respondents) found this method of tuition preferable to other methods.
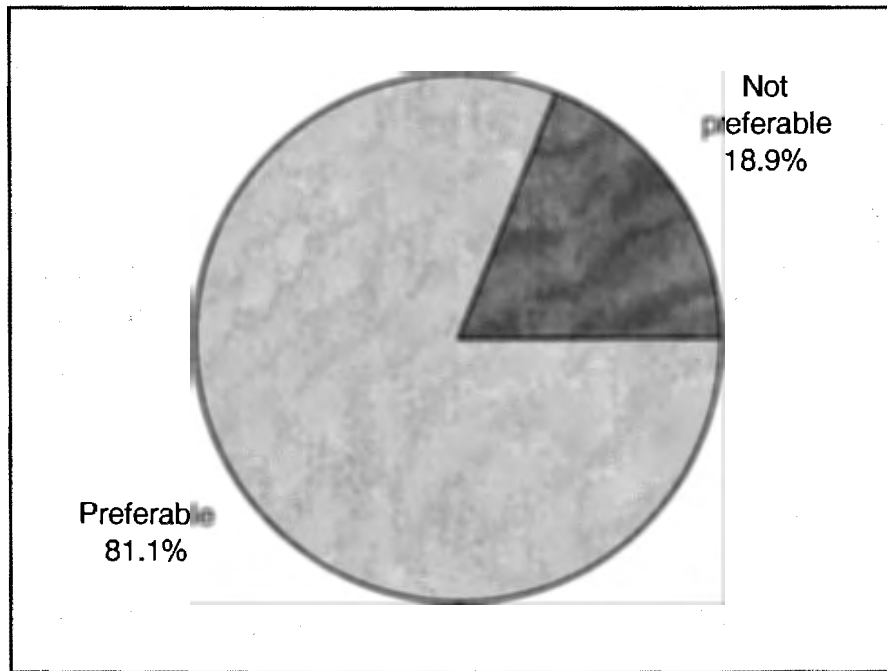
Figure 6. 4 Unisa method of tuition (N=471)

From the above analysis it is clear that the Unisa method of tuition fulfills the needs of the non-traditional adult learners for tertiary education, by offering them the opportunity to study through distance teaching. De Munnik (1993:87) explains it by saying that the need of the adult learner for tertiary education is satisfied by distance teaching, in a way that very few residential institutions can.

Taking into account the number of respondents with a Black home language (vide **Figure 6.1**), the above statistics support the findings of Van Heerden (1993:50) that the majority of the Black students used in her study, preferred Unisa's method of tuition.

Brownlee (1982:206) asked a similar question in her study on the Unisa nursing student. She differentiated between the Black, Afrikaans and English students. The majority of the Black students preferred the Unisa method of tuition to other methods they had experienced, whereas the Afrikaans and English students were more or less evenly divided. A possible reason for the difference could have been the personal and

educational circumstances and the availability of university education for the Black students compared to those of the Afrikaans and English students at that time.

In Paton's study (1988:135) nearly half of the respondents found the Unisa method of tuition suitable and therefore chose to study at Unisa.

In the second part of this question the respondents were asked to comment on their answers. Of the 471 respondents who answered the first part of the question, 386 respondents commented on their answers. When the information of this open question was coded, an attempt was made to categorise the comments as shown in the table below.

Table 6. 8 Comments on Unisa method of tuition (N=386)

Comments on Unisa method of tuition	Personal reasons		Method		Total	
	f	%	f	%	f	%
Preferable	197	51.0	101	26.2	298	77.2
Not Preferable	24	6.2	64	16.6	88	22.8
Total	221	57.2	165	42.8	386	100.0

Table 6.8 shows that 77.2 percent (298) of the 386 respondents preferred the Unisa method of tuition, for personal reasons (51.0 percent, 197) and for the method itself (26.2 percent, 101). Of the commenting respondents, 22.8 percent (88) did not prefer the Unisa method of tuition, with 6.2 percent (24) for personal reasons and 16.6 percent (64) with reasons regarding the method of tuition.

Although only 77.2 percent (386) of the 500 respondents recorded comments, valuable information was gathered from it. To illustrate the respondents' preferences and dislikes, some of the comments were quoted.

As it would not be possible to reproduce all the comments, a few of them were selected at random and some were included for a purpose. The comments quoted below were not made only by single respondents but are a reflection of the opinions of a number of respondents expressed in the words of one respondent. Therefore, although certain comments were selected at random, only those who could be backed up by similar comments were quoted.

Lecturers are readily available to help with problems by telephone, letters or personal contact. Tutorial material gives enough direction on how and what to study.

Because it is andragogic in approach which make the person look for information on her/his own rather than being spoon-fed.

Gives opportunity to us who will have never had a chance to acquire a BA(Cur)

Independence is enhanced, freedom of choice whereby a student is free to design his/her study programme under guidance in the study guides.

Practical experience could be obtained while studying

Unisa lecturers are all based in Pretoria. Hence we cannot consult them all the time as the telephone is expensive.

Learning is done at the student's pace, whilst working taking into account all other life activities which will be going on

Unisa method allows me to plan my studies to suit my own needs

Too little contact with lecturers for guidance

On the positive side the respondents described the subject material as comprehensive and good, the lecturers as always approachable, helpful and friendly, and the tuition as excellent for adult learners. They also found studying according to their own needs, time available and at their own pace, to be preferable.

The negative comments included comments on the availability and approachability of the lecturers, the subject material being too wide and too much, insufficient guidance and too little comments on assignments and the feeling of isolation. The comments also dealt with financial and domestic problems the students have/had encountered.

In her study on the nursing student at Unisa, Brownlee (1982:228) also included the comments of some of the respondents on the Unisa nursing courses. Most of the comments were more or less the same as the ones made by the respondents in this research project.

Comments made by the respondents of this research project, on the availability of lecturers, were similar to those made in Brownlee's study (1982:204-205, 225). Both groups found the student/lecturer contact to be inadequate and had a feeling of isolation. Respondents expressed the need to discuss certain problems with the lecturers but then found the lecturers not to be available telephonically. Brownlee (1982:233) was however positive that this problem would be solved in due course, as telephone conferences were under discussion and in use on an experimental basis at that time. Interestingly enough, these services are available to the students now, but the complaints remain the same. A reason which may account for this is that the students are very limited with regards to the time of day (only in the mornings) they can reach the lecturers.

6.3.4   Duration of their study

* Item 1.11

The respondents used in this research project were all registered for a third year subject during 1993 in the Department of Nursing Science. In this item the respondents were asked to point out whether they had registered for the third year subject for the first time in 1993.
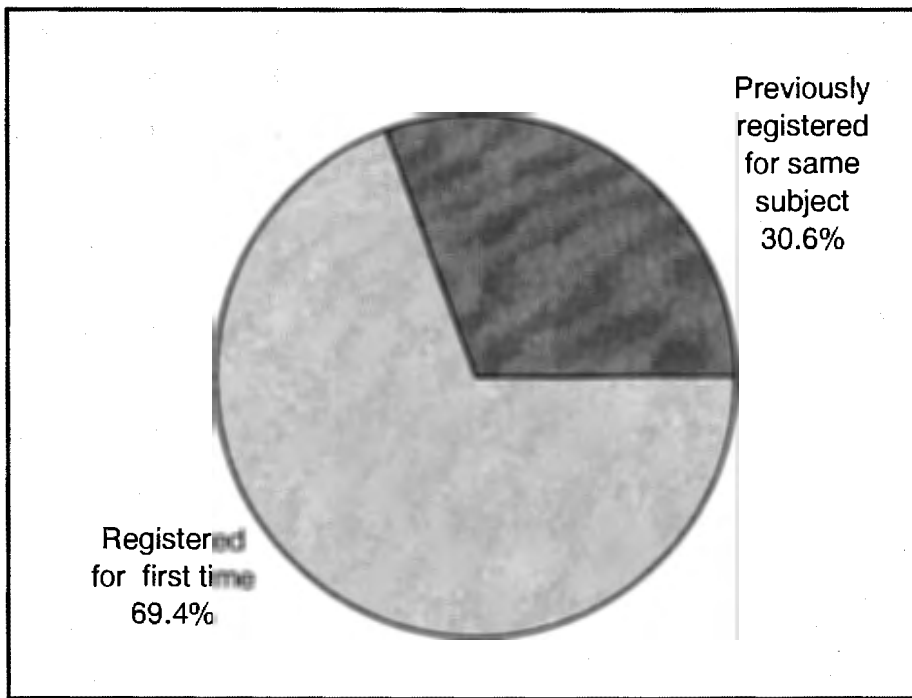
Figure 6. 5. Registration for third year subject (N=484)

Figure 6.5 reflects the respondents who were registered for the third year subject for the first time in 1993 and those who had to reregister for the third year subject in 1993.

Of the 484 respondents who completed the item 69.4 percent (336) indicated that it was a first registration and 30.6 percent (148) indicated that they were registered for the subject before.

The question asked in item 1.11 was included to reveal the overall ability of the respondents to satisfy the examiners. This overall ability is the categorising of the respondents in relation to the phenomenon called academic achievement. Although the academic achievement of students is usually revealed in a single score (percentage), it represents many interrelated components (Reilly & Oermann 1985:332). Albanese and Gjerde in Van Hoozer, Bratton, Ostmoe, Weinholtz, Craft, Albanese & Gjerde (1987:294-295) maintain the process of assigning grades (percentages) to the abilities of students is an elaboration of the decision that a student is ready to proceed to the next level of

education. Mellish and Brink (1990:289) describe the evaluation of students to determine their academic achievement as the measurement of a student's ability to practice nursing at a safe level at the end of a semester, course or syllabus.

- Item 1.12

In this item the respondents were asked to signify whether the third year subject was completed successfully or not.
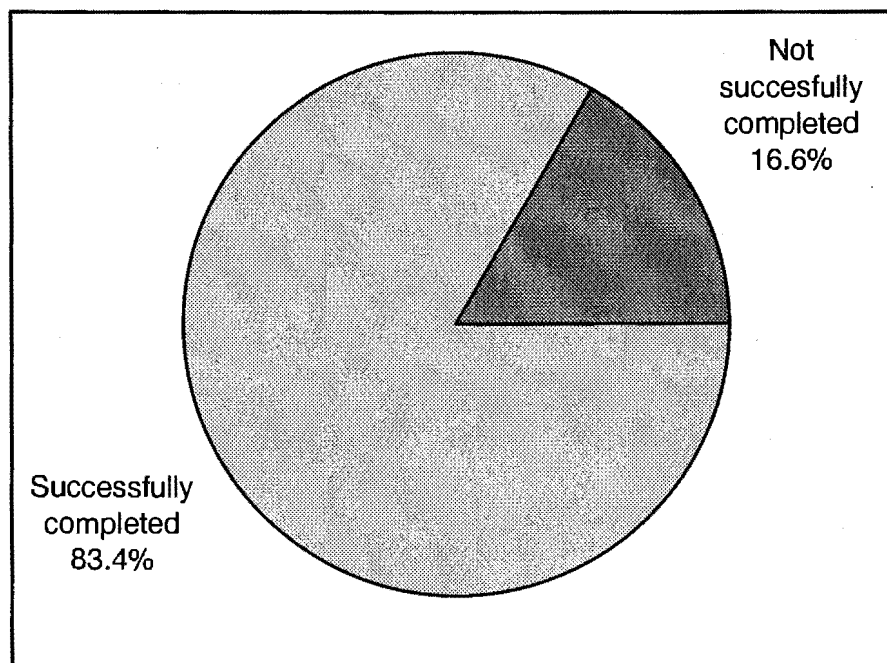
Figure 6. 6 Completion of third year subject (N=477)

Figure 6.6 indicates that of the 477 respondents, 83.4 percent (398) gave a positive answer, 16.6 percent (79) gave a negative answer. For those respondents who were registered for more than one third year subject within the Department of Nursing Science, the option was left to themselves to report back on the subject they preferred. In section 1.9 of the introductory chapter the researcher explained the equivalence between the

subjects involved. The next item in the questionnaire identified the respondents with more than one third year subject.

- Item 1.13

Item 1.13 was included to identify the number of respondents who were registered for more than one third year subject within the Department of Nursing Science.

Table 6. 9 Number of third year subjects registered for in 1993 (N=483)

Number of third year subjects registered for	f	%
One	412	85.3
Two	49	10.1
Three	1	0.2
Registered for one or two modules of a second subject	13	2.7
Not specified	8	1.7
Total	483	100.0

Table 6.9 shows the number of third year subjects the respondents were registered for. The majority (85.3 percent, 412) of the 483 respondents were only registered for one subject, 10.1 percent (49) for two subjects and 0.2 percent (one) for three subjects. Respondents who were also registered for one or two papers (modules) of another subject included 2.7 percent (13). Those respondents who indicated that they were registered for more than one subject but who did not specify the other subject consisted of 1.7 percent (eight).

The item was included to eventually enable the researcher to correlate the different examination results obtained in the third year subjects of those respondents with more than one third year subject by analysing them statistically. The results of the correlation will be discussed in chapter 7.

- Item 1.14

In item 1.14 the respondents were asked to point out the number of years they had been registered at Unisa for this BA(Cur) degree.

Table 6. 10 Number of years registered for this BA(Cur) degree (N=484)

Number of years	f	%
1	2	0.4
2	7	1.5
3 - 5	187	38.6
6 - 10	281	58.0
> -10	7	1.5
Total	484	100.0

Table 6.10 indicates the number of years they had been registered for this BA(Cur) degree. From this table it can be seen that more than half of the respondents (59.5 percent, 288) had been registered for six years or more.

When taken into consideration that Unisa nursing students are non-traditional adult learners with numerous other responsibilities, professional as well as personal, it is understood why it took the majority of the respondents at least six years to reach the third year level.

The respondents who had been registered for two years or less are probably in possession of another Unisa nursing qualification, a post registration degree from another university or those who have had exemption from the first year. These respondents therefore were allowed to register for two levels of a subject in one year, such as Nursing administration 1 and 2.

• Item 1.15

This item was included to ascertain how the respondents rated their capabilities. The respondents had the opportunity to indicate the number of subjects as well as the number of modules they would be prepared to attempt in one year. The majority (84.5 percent, 409) of the 484 respondents did not differentiate between the number of subjects and the number of modules.

Table 6. 11 Number of subjects/modules respondents were prepared to attempt per year (N=484)

Number of subjects modules	f	%
One	17	3.5
Two	207	42.8
Three	169	34.9
Four	16	3.3
Different numbers of subjects and modules	75	15.5
Total	484	100.0

Respondents who indicated that they could only cope with one subject or module per year represented 3.5 percent (17 respondents). The majority of the respondents felt that they could cope with two (42.8 percent, 207) or three (34.9 percent, 169) subjects or modules per year, whereas a small percentage of 3.3 (16) indicated that they could cope with four subjects or modules.

Some of the respondents (15.5 percent, 75) differentiated between subjects and modules. However, no relationship between the number of subjects and the number of modules they had given could be identified. It does leave a feeling of concern, since most of these respondents (12.4 percent, 60) indicated that they could cope with nine modules per year. It is difficult to say whether they reacted on their previous success rate, showed a lack of insight or did not seek advice on planning their curricula. Another concern is that third year nursing subjects are at major level which includes three modules with a heavy workload.

It is however reassuring to note that 81.2 percent (393) of the respondents felt that three or less subjects or modules per year are enough. On the other hand, according to Brownlee's statistics (1982:180), the majority of her respondents stated that two third year nursing subjects (implying six modules) often complement each other and could be managed in one year.

The suggestion that Unisa nursing students can be described as experienced learners did not seem to affect the respondents' rating of their capabilities negatively. Taking into account that a vast majority of the respondents were employed full-time with unconventional working hours, they seemed to be realistic in their rating. The above corresponds with the explanation given on the analysis of item 1.14 (see **Table 6.11**).

6.3.5 Planning of study time

- Item 1.16

In item 1.16 the respondents were asked to indicate the number of hours they devote to their studies.

Table 6. 12 Hours devoted to studies in an average week (N=469)

Hours per week	f	%
1 - 5	77	16.4
6 - 10	193	41.2
11 - 15	94	20.1
16 - 20	41	8.7
> 20	64	13.6
Total	469	100.0

From **Table 6.12** it is clear that 41.2 percent (193) of the respondents devoted between six and ten hours to their studies in an average week. Only 28.8 percent (135) of the respondents indicated that they study between 11 and 20 hours per week. Not many respondents (13.6 percent, 64) devoted more than 20 hours to their studies in a week.

In the study guides for the nursing subjects, the students are advised to plan their study time according to each subject. It is suggested that students spend at least six hours per week per subject. According to Adey, Gous and Potgieter (1987:19) the majority of distance students study between 13 and 15 hours per week. Van Heerden (1993:58) supports the findings of another study that the majority of students study between five to ten hours per week and the second most students study between 11 and 12 hours per week. According to Brownlee (1982: 202) it is generally accepted that the majority of Unisa students need to devote at least ten hours a week to each subject.

Table 6.11 shows that 77.7 percent (376 of 484) respondents were prepared to attempt two or three subjects or modules per year. It therefore means that this majority of respondents should devote between 12 and 18 hours to their studies in an average week. This implies that too little study time is planned for by most of the respondents.

- Item 1.17

A carefully devised study programme could make a considerable difference to the outcome of learning and should be common amongst learners, especially experienced learners. Quinn (1988:109) suggests that attentive planning for study must be a natural part of the learner's life just like all other activities in life.

Item 1.17 was included to establish whether Unisa nursing students study according to a study programme.
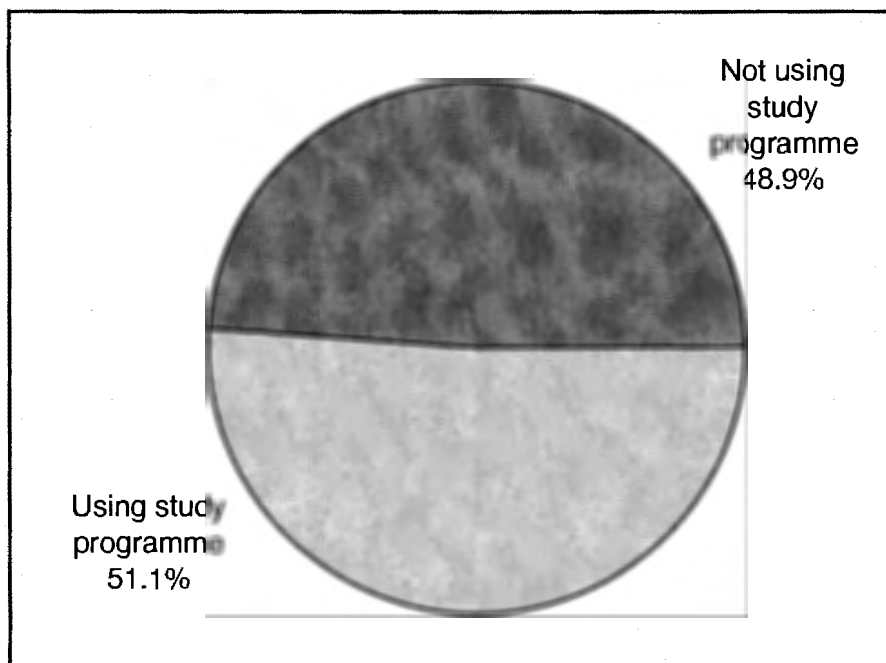
Figure 6. 7 Respondents' use of a study programme (N=481)

From **Figure 6.7** it can be seen that more or less half (51.1 percent, 246) of the respondents study according to a study programme and that the other half (48.9 percent, 235) do not.

Van Heerden (1993:58) identified a problem in her study on Black Unisa students, regarding the planning and use of a study programme. According to her findings, the students knew it is usually expected of them to study according to a plan, but did not adhere to these expectations. She did however find a correspondence between the students who studied according to a study programme and high academic achievement (Van Heerden 1993:66).

Distance education students need to organise their learning to fit in with their personal and professional tasks (Steyn 1994:39). With the information of the two items above at hand, the planning and organising of study time by means of a study programme seems to be an issue that could be addressed.

6.3.6   Responsibilities of the respondents

Non-traditional students have pressing social, family and professional commitments to contend with, in addition to their student commitments. These commitments will necessarily have an impact on their study time.

To circumscribe the responsibilities other than student commitments of the Unisa nursing students, items to establish activities and responsibilities which influenced their study programme, were included.

An interesting observation was made in the processing of items 1.18 and 1.19. When the respondents were asked whether they studied according to a study programme, only 51.1 percent (246) of the respondents responded positively. Thus, 48.9 percent (235) of the respondents indicated that they did not study according to a study programme. However, when processing the data obtained in the above two items, 379 respondents (78.6 percent of 482 respondents) indicated that other professional activities and 401 respondents (83.5 percent of 480 respondents) indicated that personal activities influenced their study programme. The question now arises whether there were not more

respondents who studied according to a study programme, possibly an informal programme, without realising it.

- Item 1.18

Item 1.18 was included to identify the additional professional responsibilities of the respondents.
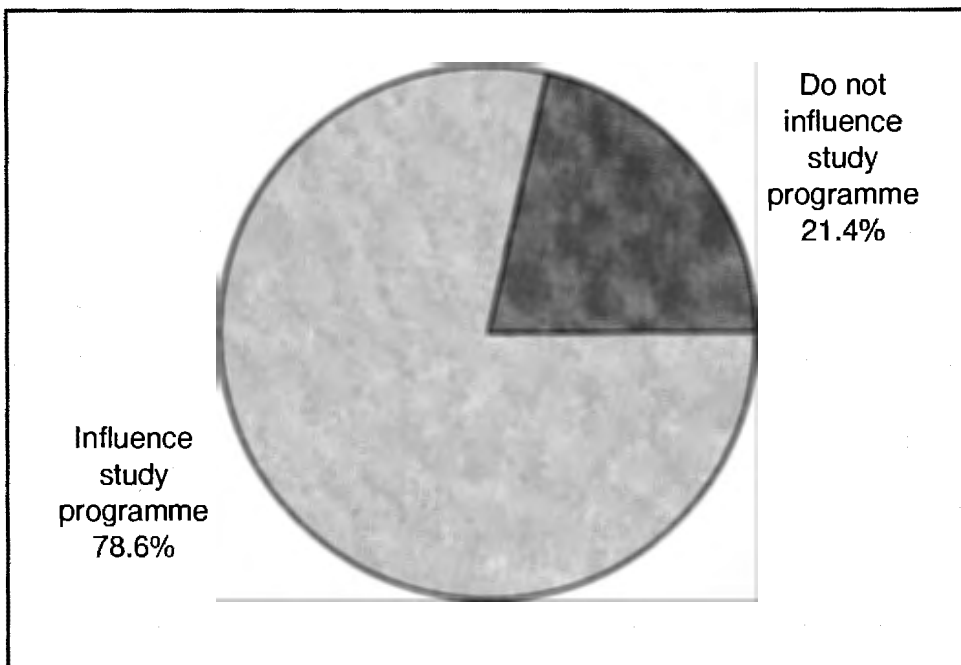
Figure 6. 8 Professional activities (N=482)

From **Figure 6.8** it can be seen that the majority of the respondents (78.6 percent, 379) indicated that other professional activities influenced their study programme. Only 21.4 percent of the respondents (103) commented that professional responsibilities did not affect their study programmes.

In the second part of this item the respondents were given the opportunity to comment on their answer.

Table 6.13 Professional activities influencing the respondents' study programme (N=340)

Professional activities	f	%
Work related activities	248	72.9
Working hours	52	15.3
Positive effect on study programme	40	11.8
Total	340	100.0

Most of the 340 respondents (72.9 percent, 248) indicated that a continuation of their professional responsibilities after hours influenced their study programme. These responsibilities included attendance of work-related meetings, fieldwork, involvement in professional organisations and attendance of their meetings and symposia and also work-related travelling.

Only 15.3 percent (52) of the respondents indicated that their working hours influenced their study programme. The reason their working hours influenced their study programme was often stated as involvement in additional professional activities like a second or even a third job. This tendency is increasing alarmingly, probably due to financial reasons.

Some of the respondents (11.8 percent, 40) commented that their professional activities affected their study programme positively in the sense that it complemented their Unisa studies. This could indicate that a great number of Unisa students are dedicated to their profession and to further professional development.

• Item 1.19
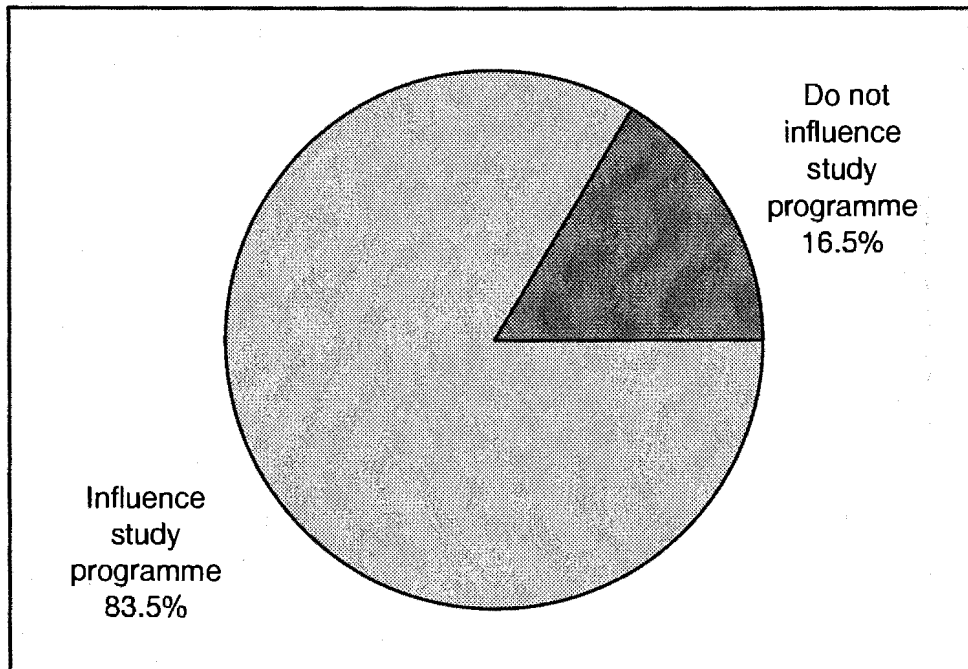
Figure 6. 9 Personal activities (N=480)

Of 480 respondents 83.5 percent (401) indicated that personal activities influenced their study programme (see **Figure 6.9**). Only 16.5 percent (79) of the respondents did not find their personal responsibilities to be a problem when studying. These statistics correspond with the description of an adult learner.

• Item 1.20

This item was included to try to establish to which extent personal responsibilities influenced the study programmes of the respondents.
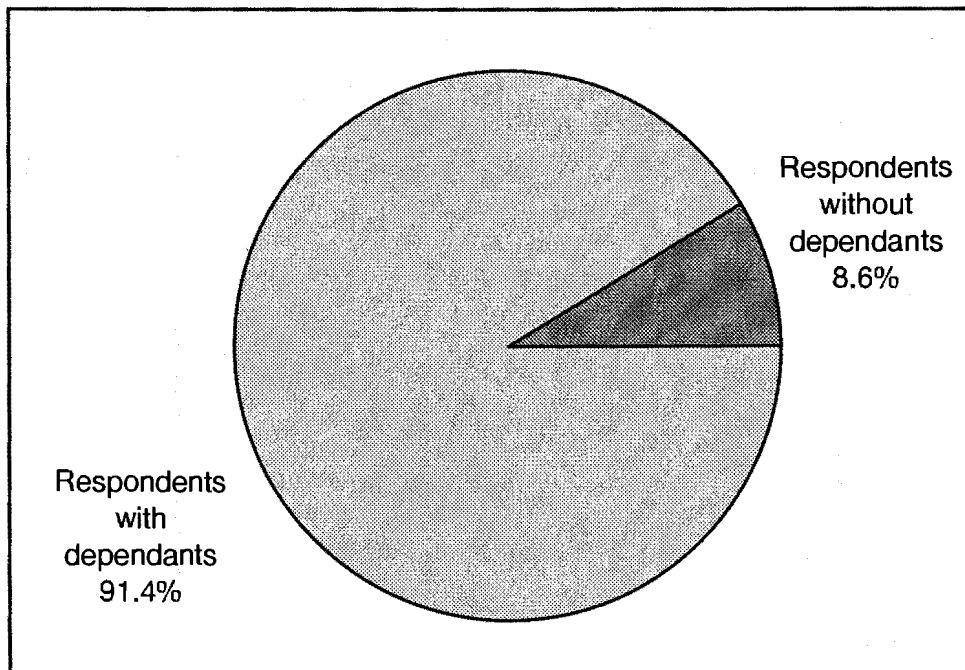
Figure 6. 10 Respondents' dependants (N=486)

From **Figure 6.10** it is clear that almost all the respondents (91.4 percent, 444) had dependants who needed their attention at home.

In the second part of the question the respondents who indicated that they had dependants were asked to reveal the hours devoted to those dependants per day.

From **Figure 6.11** it can be seen that the time devoted to dependants was mainly between two and six hours per day. Very few (11.2 percent, 47) of the 419 respondents indicated that they devoted more than six hours to their dependants per day. These figures are understandable taking into account the fact that the vast majority were employed full-time and on top of that university students.
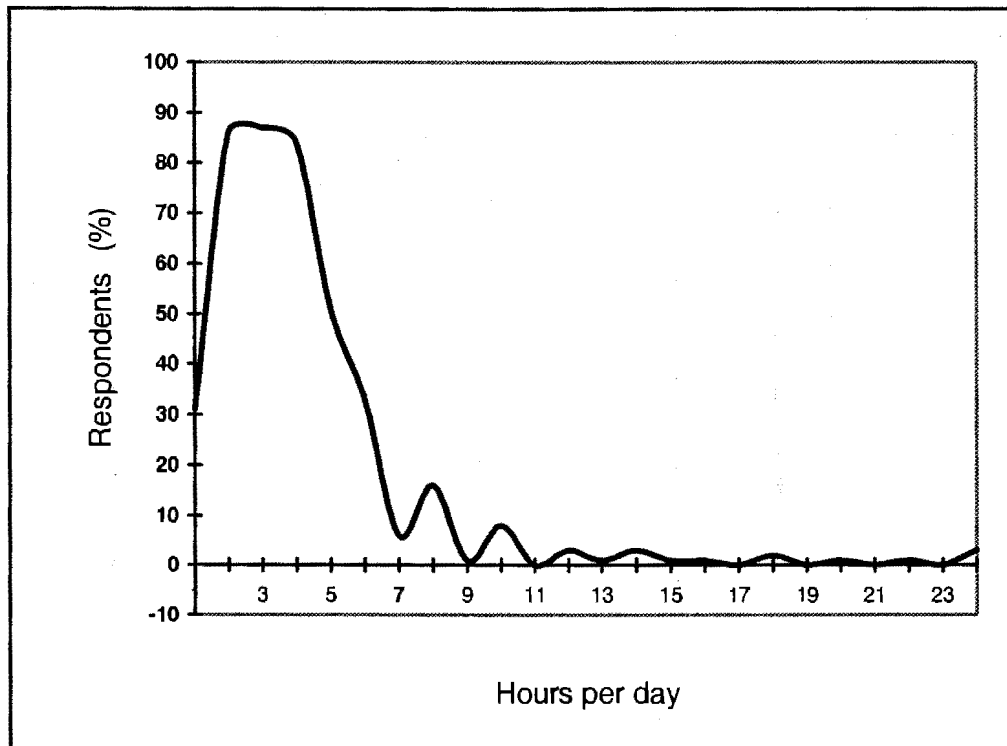
Figure 6. 11 Time devoted to dependants (N=419)

6.4   MOTIVATION OF THE RESPONDENTS

Motivation is concerned with the reasons why people behave in a certain way (Quinn 1988:72). An accurate assessment of a learner can only be made, if the learner's motivation to do well can be determined (Van Hoozer et al. 1987:295). The following four items were related to the motivation of the respondents.

- Item 1.21

Item 1.21 gave the respondents the opportunity to indicate the reason or reasons for doing the course at Unisa. The respondents were allowed to select more than one reason if they wished to (see **Table 6.14**).

A variety of interesting 'other' reasons were also given by the respondents. When coding the questionnaires, these reasons were grouped as shown in the table below.

Table 6. 14 Reason/s for doing the course (N=500)

Reason		f	%
A sincere desire to obtain the specific qualification		311	62.2
It is expected of me		30	6.0
To qualify for promotion		74	14.8
To obtain a post with more suitable conditions of service		163	32.6
No specific reason		9	1.8
Other	Professional growth and development	122	24.4
	Personal growth and development	109	21.8
	Improve service to the community	10	2.0

The sincere desire to obtain the specific qualification seemed to be an important reason for doing the course. Reasons given by the respondents, other than the specified ones, were all positive. Professional and personal growth and development as reason for doing the course, could also be interpreted as a sincere desire to obtain the qualification. A small number of respondents (ten) indicated that they felt a need to develop themselves to be able to render a better service to the community.

Almost half of the respondents (47.4 percent, 237) felt that the qualification would eventually improve their employment situation. To obtain a post with more suitable conditions of service and to qualify for promotion, which often brings along better conditions of service, are understandable reasons bearing the employment conditions and responsibilities of the respondents in mind.

Only 7.8 percent (39) or the respondents showed a nonchalant attitude by indicating that they either had no specific reason for doing the course or that it was expected of them.

According to Schulze (1992:24) older students often study because they are interested in a certain subject and not only because they want to obtain a qualification.

- Item 1.22

Item 1.22 was included to establish how motivated the respondents were to achieve success.

Table 6. 15 Motivation for success (N=479)

Level of Motivation	f	%
Strongly motivated	391	81.6
Motivated	82	17.1
Don't care	6	1.3
Total	479	100.0

Table 6.15 shows that 81.6 percent (391) of the respondents felt strongly motivated to achieve success with the course.

- Item 1.23

The question asked in item 1.23 was to establish the extent to which the respondents believed in themselves and their academic abilities (see **Figure 6.12**). For those who were in doubt whether they would be able to achieve success, an opportunity was given to verify their answer (see **Table 6.16**).
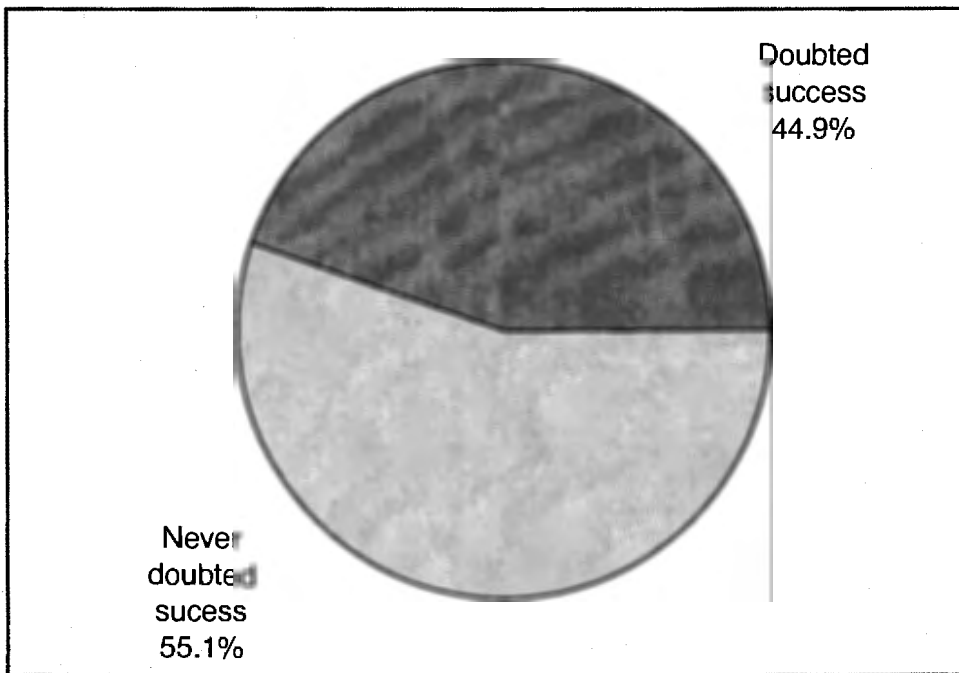
Figure 6. 12 Ability to complete course successfully (N=486)

Figure 6.12 shows that 55.1 percent (268) never doubted success. However, a fairly big proportion (44.9 percent, 218) of the respondents doubted their ability to complete the course successfully. Of the latter group of respondents only two did not give the reason/s why they felt that way.

Table 6. 16 Reasons for doubting success (N=216)

Reasons	f	%
Course itself	27	12.5
Student/Lecturer contact	12	5.5
Personal reasons	139	64.4
Professional responsibilities	14	6.5
Specific subject	21	9.7
Practical component of course	3	1.4
Total	216	100.0

As seen in **Table 6.16** most of the respondents (64.4 percent, 139) indicated that reasons of a personal nature caused them to doubt success. These reasons included financial problems, lack of support at home, advanced age and domestic problems.

Problems regarding the course itself mainly included complaints about the content of the course. In their comments the respondents said that the content was too wide, too much for the time available and the content of different subjects too repetitive

Some of the respondents (5.5 percent, 12) mentioned the lack of student/lecturer contact as a reason for doubting success. They felt isolated because they had nobody to discuss the work with when they needed it the most. The unavailability of the lecturers after hours, their usual study time, made them feel helpless. These problems were also mentioned in other items of the questionnaire.

Fourteen (6.5 percent) of the respondents indicated that their professional responsibilities and circumstances had an influence on their study time. Three (1.4 percent) of the respondents mentioned the practical component as unprogressive, too repetitive and too wide, causing delay in their studies. Comments specifically pertaining to the practica, were also recorded in other items.

The 9.7 percent (21) of the respondents who specified a subject as being the reason for their uncertainty, all commented that Sociology was a demotivating experience as they battled to pass this subject only. They did not battle to pass any of the other subjects. This problem was also repeatedly mentioned in item 1.24 where the respondents had the opportunity to express their experiences of the course.

- Item 1.24

Item 1.24 was included to determine how the respondents had experienced their studies

at Unisa which could have also influenced the level of motivation. It gave the respondents the opportunity to express their overall perception of the Unisa nursing course. Furthermore, the researcher foresaw that the comments could identify some specific needs of Unisa nursing students as well as limitations and problems regarding the Unisa nursing courses.

According to Schulze (1992:23) there is a relationship between motivation and students' perception of their studies. More motivated students usually experience their studies more positively. **Table 6.15** shows that the majority (81.6 percent, 391) of the respondents were strongly motivated to achieve success.

Table 6. 17 Experiences of BA(Cur) course (N=477)

Experience	f	%
Very negative	15	3.1
Negative	74	15.5
Neutral	234	49.1
Positive	125	26.2
Very positive	29	6.1
Total	477	100.0

An attempt has been made to categorise the responses into five groups, as shown in the table above. It should be kept in mind that some of the respondents recorded various comments. The pros and cons of each comment were considered separately and only thereafter the overall category was determined. Where a respondent recorded a positive and a negative comment, it was sometimes categorised as neutral, because the positive comment tempered the negative one and visa versa.

Approximately half of the respondents (49.1 percent, 234) reflected neutral opinions on the BA(Cur) course. Neutral opinions included phrases like the following:

... difficult ... but rewarding ...

... die kursus is goed ...

... interesting but the practica part was too boring because of repetition ...

... too much work ... lecturers were very helpful ...

... interesting and most enriching ... financially not worthwhile ...

Positive feelings about the course were recorded by 26.2 percent (125) of the respondents and were described as follows:

... deeply feel I've developed a lot professionally ...

... developed confidence in whatever I do ...

... willingness to help ... only telephone call away ...

... study at my own pace ... according to own needs ...

... eye opening ... very motivating ...

Those respondents (6.1 percent, 29) who experienced the course very positively, expressed their thoughts by recording comments like:

... kursus en dosente puik ... standaard baie hoog ...

... correlation of theory and practice extremely well done ...

... dosente gaan uit hul pad om jou te help ...

... lecturers lead their students to high academic achievement ...

... I grew extremely ... influenced my whole life ...

On the other hand, negative opinions, recorded by 15.5 percent (74) of the respondents, included comments like:

... te veel kursusse in die kurrikulum ...

... insiggewend maar baie frustrerend ... dosente nooit beskikbaar ...

... taxing to ones time and social background ...

... very lonely ...

... telephone contact with lecturers was both costly and often very disappointing ..

The respondents who were very negative, were in the minority (only 3.1 percent (15) of the respondents). They were certainly not restrained in airing their views, which included comments like:

... often think papers are not marked ... simply get a failure mark ...

... very negative ... specifically the nursing subjects ...

... lecturers illprepared to assist one constructively ...

... subject matter confusing and irrelevant ...

... lecturers know nothing about practical ... must contact well-equipped nurses to correlate theory and practice ...

The comments recorded in this item also corresponded to a great extent with the comments recorded in item 1.10.

The respondents reacted well to the invitation to air their views, feelings, thoughts and experiences and many said that they were grateful for the opportunity offered to them to express themselves. Their positive feelings and experiences as well as their thanks were recorded freely. Dissatisfaction, disapproval and disappointment were recorded quite freely, but positive suggestions and requests were also put forward.

6.5   CONCLUSION

The analysis of the first section of the questionnaire enabled the researcher to compile a profile of Unisa nursing students in terms of their demographic and academic profile. Their motivation to study at Unisa, as well as their experiences during their study time, was also determined. This information serves as a basis for the following chapter.

In the following chapter the second section of the questionnaire is analysed. Information from this section is used where correlations are drawn between the learning styles of the respondents and other important aspects.

■■■

CHAPTER 7

ANALYSIS AND DISCUSSION OF LEARNING STYLES

7.1   INTRODUCTION

This chapter focuses on the analysis of the learning styles of the respondents. Data regarding the learning styles were obtained in the second section of the research instrument. The research instrument was discussed in section 5.5 of chapter 5. The statistical data obtained are discussed and presented in tables and a plotted figure. The techniques used for the statistical analyses as well as the level of significance are discussed.

The information regarding the preferred learning styles of the respondents was obtained by using the Marshall and Merritt Learning Style Questionnaire. The Kolb model of experiential learning, which has been discussed in section 2.3 of chapter 2, is used to describe these learning styles.

This chapter also deals with the correlational study component of the research project. Correlations between the major constructs below, will be discussed.

- Learning style and academic achievement

- Learning style and distance teaching

- Learning style and home language

- Distance teaching and perception of the Unisa nursing course

7.2   CONSIDERATIONS FOR STATISTICAL ANALYSES

7.2.1   Pearson product moment correlation

The Pearson product moment correlation coefficient is one of the most widely used correlation coefficients, designating the magnitude of relationship between two variables. It is referred to as Pearson's r (Brink 1987:80; Polit & Hungler 1993:283, 442).

The relationship between two variables is measured on an interval scale which indicates a linear correlation that varies from +1.00 through 0.00 to -1.00. The measurements of a linear correlation, when plotted on a grid, will form an oval shaped pattern that can be approximated by a straight line. A correlation coefficient of +1.00 means that changes in one variable are exactly proportional to changes in the other variable, which means there is a perfect positive correlation. Where a relationship exists but is not perfect, the correlation coefficient will probably be in the vicinity of 0.50 or 0.60. When the correlation coefficient is 0.00, it means that change in one variable is totally unrelated to change in the other variable. In this case the pattern of the plots on a grid will form a circle. However, the absence of a significant correlation between the variables cannot simply be interpreted as an absence of a relationship between the variables. It only means that there is no linear correlation between the variables. The relationship might in fact be non-linear.

When there is a negative or inverse relationship between two variables, the correlation coefficient will be running between 0.00 and -1.00. A weak relationship between variables will probably be in the vicinity of -0.30. Where a complete negative relationship exists between two variables, the correlation coefficient will be -1.00.

The correlation coefficient can only be determined where two measures (constructs) can be described as variables which are related to each other in the research (Brink 1987:80; Hardyck & Petrinovich 1975:146-147; Lemke & Wiersma 1976:28-31; Polit & Hungler 1993:283-284, 300, 442; Woods & Catanzaro 1988:416).

In this research project the Pearson product moment correlation coefficient was used to determine the correlation between the learning styles and examination results of the respondents and between the examination results of the four different subjects.

7.2.2 Chi-square test (X^2)

The Chi-square test is a non-parametric test of statistical significance used to assess whether a relationship exists between two nominal-level variables. It is the most widely used statistical test for data that are in the form of categories and frequencies and involves a comparison between an observed frequency and an expected frequency of cases (Brink 1987:123; Polit & Hungler 1993:299, 432; Woods & Catanzaro 1988:415-416).

In this research project the Chi-square test was used to assess whether a significant correlation existed between the respondents' preferences for the Unisa method of tuition and their experiences of the Unisa nursing course.

7.2.3 The t-test

The t-test is a parametric statistical test used for analysing the statistical significance of difference between the means of two sets of data (groups). Two types of t-tests can be used. The t-test for independent samples is used to compare the means obtained from two independent samples or groups. Where the research question concerns group differences, this will be the appropriate test. Information about the group means, sample size and subject variability is essential for the t-test. The t-test for dependent samples is used to compare the means of two sets of dependent measures (Brink 1987:146; Polit & Hungler 1993:293-294, 448; Woods & Catanzaro 1988:406).

In this research project the *t*-test was used to determine whether significant differences existed between the respondents' preference for the Unisa method of tuition and their home language with regards to their learning styles.

7.2.4 Factor analysis

Factor analysis is a statistical procedure used to reduce a large set of variables into a smaller set of variables called factors or dimensions. It thus reduces the number of variables one has to cope with by identifying which variables go together as unified factors. A factor is thus a group of variables that have a certain characteristic in common. If variables are not combined to form a factor, it is necessary to compute the statistics for all the variables individually. Factor analysis therefore offers an objective, empirical method for discovering the underlying structure of a large number of variables. (Brink 1987:154; Hardyck & Petrinovich 1975:183; Kerlinger 1986:569; Polit & Hungler 1993:307, 436; Woods & Catanzaro 1988:428).

The factor analysis procedure involves two phases, namely factor extraction and factor rotation. In the factor extraction phase variables are intercorrelated to identify clusters of highly interrelated variables. Factors are derived from these clusters. Factor rotation is the second phase of the factor analysis procedure. In this phase the factors are manipulated in such a way that the results can be interpreted. The result of factor rotation is called a factor matrix (Kerlinger 1986:569; Polit & Hungler 1993:307; Woods & Catanzaro 1988:428-429).

The loading of a variable on a factor is a measure of the extent to which a specific factor is present in a given variable. It shows how every variable is correlated with the factor. The maximum a factor loading can reach is 1.00. (Hardyck & Petrinovich 1975:183).

In this research project a factor analysis was performed on the items of the Marshall and Merritt Learning Style Questionnaire. Considering that sources indicated that either two

or four factors underlie the items of the questionnaire, it was decided to extract both a two factor and a four factor solution (Marshall & Merritt 1985:935; Marshall & Merritt 1986:259).

Kerlinger (1986:576) describes the principle factors method as a mathematically satisfying method. This method was used in the present research project with the aid of the PROC FACTOR routine of the Statistical Analysis System (SAS) software.

Kaiser in Morrison (1967:327) has proposed the varimax criterion for orthogonal rotation as a measure of simple structure to obtain the factor loading. In this research project the factor solutions were rotated by the PROC FACTOR routine with the varimax criterion to obtain maximally interpretable solutions. These varimax rotated solutions are reported in this chapter.

7.2.5   Cronbach Alpha coefficient as reliability coefficient

The Cronbach's Alpha, is a widely used reliability index that estimates the internal consistency, which is based on the intercorrelation of all the items in a scale examined simultaneously. The indexes of internal consistency range in value between 0.00 and 1.00 with 1.00 denoting perfect internal consistency and 0.00 no internal consistency. Therefore, the higher the reliability coefficient, the more accurate or internally consistent the measure (Polit & Hungler 1993:247; Woods & Catanzaro 1988:250).

In this research project the Cronbach's alpha was used to determine the reliability of the Marshall and Merritt Learning Style Questionnaire.

7.2.6 Level of significance

To control the likelihood of committing errors in decision making, a level of significance is chosen. The level of significance of a statistical test defines the probability level that is to be considered too low to warrant support of a hypothesis being tested. It also refers to the probability that an observed relationship could be caused by chance. The significance level is referred to as the p value or alpha level. The two most frequently used levels of significance are 0.05 and 0.01 (Brink 1987:115; Polit & Hungler 1993:290, 446; Winer 1962:11; Woods & Catanzaro 1988:401).

To be able to state that the results of this research project are statistically significant, a significance level had to be determined. The importance of determining a p value is to eventually refer to the fact that the results were unlikely to be attributable to chance. The significance level used throughout the analysis of this research project was 0.05, which is a common level used in most social science or behavioral research (Woods & Catanzaro 1988:401).

7.3 KOLB MODEL OF EXPERIENTIAL LEARNING

The Kolb model of experiential learning denotes four modes of learning, which are concrete experience (CE), reflective observation (RO), abstract conceptualisation (AC) and active experimentation (AE). These modes form two orthogonal, bipolar dimensions or factors. Abstract conceptualisation is the polar opposite of concrete experience (AC-CE) and active experimentation the polar opposite of reflective observation (AE-RO). An individual's score combination on the two dimensions indicates the extent to which an individual emphasizes abstractness over concreteness (AC-CE) and the extent to which the individual emphasizes action over reflection (AE-RO) (Kolb 1984:68). It therefore reflects the preferred style for processing information.

The four information processing learning styles deriving from this score combination, are:

- Diverger (CE/RO)

- Assimilator (RO/AC)

- Converger (AC/AE)

- Accommodator (AE/CE) (Kolb 1984:68-69).

(See section 2.3 and **Figure 2.1** in chapter 2.)

In this research project the dimensions are scored in such a way that a high score (=5) on the abstract conceptualisation and concrete experience (AC-CE) dimension means the mode of learning is predominantly concrete experience, while a low score (=1) means the mode of learning is predominantly abstract conceptualisation. For the active experimentation and reflective observation (AE-RO) dimension a high score (=5) means the mode of learning is predominantly reflective observation and a low score (=1) means the mode of learning is predominantly active experimentation.

7.4   VALIDITY AND RELIABILITY OF THE LEARNING STYLE QUESTIONNAIRE

7.4.1   Validity of the Learning Style Questionnaire

Validity refers to the degree to which the instrument measures what it is intended to measure. The validity of the instrument is not independent from its reliability. Determining the validity of the instrument means the assessment of content validity, criterion related validity and construct validity (Brink and Wood 1988:162; Kerlinger 1986:417; Polit & Hungler 1993:249, 448; Woods and Catanzaro 1988:319).

Before the pilot study was conducted, the questionnaire was presented to experienced nurse educators to test the face and content validity.

7.4.1.1 Construct validity of the Learning Style Questionnaire

Construct validity is concerned with the logical analysis and the testing of relationships predicted on the basis of theoretical considerations (Brink 1987:162; Polit & Hungler 1993:251). It can be defined as the degree to which the instrument measures the construct under investigation (Polit & Hungler 1993:433). Construct validity describes the interrelation of the characteristics of variables (Kerlinger 1986:420; Woods & Catanzaro 1988:253, 554).

A factor analysis was performed on the intercorrelation of the 40 items of the Learning Style Questionnaire (see appendix B for the Learning Style Questionnaire). Both a four-factor and a two-factor analysis were obtained, using the principle factors method. This method is described in section 7.2.4 of this chapter.

The decision to extract two and four factors is based on the work done by Marshall and Merritt who followed this procedure when the reliability and construct validity of their learning style, used in this research project, was investigated (Marshall & Merritt 1986:257-262). The factor solutions were rotated according to the varimax criterion, described in section 7.2.4 of this chapter, to obtain a maximally interpretable rotated solution. On inspection of these solutions it appeared that the two-factor solution made most theoretical sense. This finding is in accord with the findings of Marshall and Merritt (1986:260). The complete two-factor solution is given in Appendix D, **Table D1**.

It was decided to consider the items with factor loading higher than 0.30 as representative of that factor. However, items with a factor loading between 0.20 and 0.30 were also evaluated on theoretical grounds and were included when it was found that they were descriptive of the factor. In this way the items representative of the two factors

were identified. The factors, items and the factor loading are presented in **Tables 7.1** and **7.2** below.

Table 7. 1 Representative items of factor 1 (AC-CE)

Factor	Item	Correlation	Response Continuum
Factor 1	2.24	0.72	analytical - emotional
AC-CE	2.36	0.69	intellectual - emotional
	2.29	0.67	thinking - instinctive
	2.26	0.62	careful - emotional
	2.27	0.61	logical - sentimental
	2.17	0.55	reason - hunch
	2.38	0.55	evaluation - sensitive
	2.15	0.53	consider - impulsive
	2.34	0.51	resolving - feeling
	2.23	0.35	involved - distant
	2.39	0.3	solve - reflect
	2.4	-0.33	** sensing - thinking
	2.5	-0.37	** premonition - reason
	2.25	-0.4	** intuitive - reasoning
	2.18	-0.43	** impulsive - planning
	2.14	-0.45	** emotional - rational
	2.3	-0.51	** hunch logical

** Response continuum reversed during analysis.

Factor one, consisting of 17 items, is represented by the abstract conceptualisation and concrete experience dimensions or learning modes (AC-CE). From **Table 7.1** it can also be seen which responses of the items represent which dimension or learning mode of the

bipolar factor. The responses are in the same order as the dimensions, in other words *thinking* represents the abstract conceptualisation dimension and *emotional* represents the concrete experience dimension of factor one. Some of the responses, as indicated in **Table 7.1**, were reversed during the analysis.

Table 7. 2 Representative items of factor 2 (AE-RO)

Factor	Item	Correlation	Response Continuum
Factor 2	2.11*	-0.25	acting - reflecting
AE-RO	2.7*	-0.26	participation - observation
	2.32*	-0.29	doing - watching
	2.6	-0.32	active - reserved
	2.8	0.7	** watching - acting
	2.9	0.69	** observing - doing
	2.31	0.66	** passive - active
	2.2	0.64	** observation - participation
	2.35	0.62	** reflecting - performing
	2.3	0.57	** reserved - demonstrative
	2.33	0.57	** view - execute
	2.37	0.57	** reflective - productive
	2.22	0.51	** ponder - do
	2.2	0.42	** witness - exhibit

** Response continuum reversed during analysis.

* Items included in the final analysis on theoretical grounds.

Factor two, consisting of 14 items, is represented by the active experimentation and reflective observation dimensions or learning modes (AE-RO). The responses representing the two dimensions of this bipolar factor are reflected in **Table 7.2**. *Participating*, for instance, represents the active experimentation dimension of factor two

and *watching,* for instance, represents the reflective observation dimension of this factor. The responses that were reversed during the analysis are identified accordingly.

An inspection of the items of each factor revealed the same as what Marshall and Merritt (1986:260-262) described in their research. Although not all the items of the Learning Style Questionnaire were included as representative of a factor, the predominant picture is in accordance with the Kolb model of experiential learning (Kolb 1984).

The researcher concludes that the Marshall and Merritt Learning Style Questionnaire has an acceptable two-factor construct validity which was confirmed by the results of the factor analysis. The factor analysis determined the extent to which the items that loaded on the same factor also belonged according to theoretical expectations.

7.4.2   Reliability of the Learning Style Questionnaire

Reliability refers to the degree of consistency or dependability with which the instrument measures the attribute it is designed to measure (Brink and Wood 1988:162; Polit & Hungler 1993:244, 445; Woods and Catanzaro 1988:318).

To determine reliability, an objective procedure is used to compute a reliability coefficient, which is a numeric index of how reliable the test is. Reliability coefficients (designated as *r*) range from a low of 0.00 to a high of 1.00 (Polit & Hungler 1991:372, 643; Polit & Hungler 1993:247; Woods & Catanzaro 1988:250).

The Cronbach's Alpha was used in this research project to estimate the internal consistency, as discussed in section 7.2.5 of this chapter.

Each of the two factors identified (AC-CE and AE-RO) constitutes a scale in this research project. It was decided to calculate the Cronbach's Alpha for each of these scales. The

coefficients were found to be 0.87 for factor one (AC-CE) and 0.85 for factor two (AE-RO).

It was concluded that the reliability of these factors was satisfactorily high. These scores therefore provided support for the reliability of the Marshall and Merritt Learning Style Questionnaire.

7.5 LEARNING STYLES OF THE RESPONDENTS

A factor analysis was done to determine the learning styles of the respondents. It was decided to compute for each respondent a score on both factors, where the score on a particular factor was calculated as the mean score on all the items constituting that factor, for example:

Factor one (AC-CE) = Mean of items 4, 5, 14, 15, 17, 18, 23, 24, 25, 26, 27, 29, 30, 34, 36, 38, 39 = 2.10 (s=0.66)

Factor two (AE-RO) = Mean of items 2, 3, 6, 7, 8, 9, 11, 20, 22, 31, 32, 33, 35, 37 = 2.29 (s=0.74)

The scores obtained on each factor classified the respondents into the four learning styles of the Kolb model of experiential learning as illustrated in **Figure 7.1** below.

Figure 7.1 depicts the mean of the scores of each respondent on factor one (AC-CE) and factor two (AE-RO). The majority of the scores fall on the abstract conceptualisation and active experimentation (AC-AE) dimensions which classifies the predominant learning style of the respondents as converger. The mean score of all the respondents on factor one (AC-CE) was 2.10 and the standard deviation was 0.66, while the mean score of all the respondents on factor two (AE-RO) was 2.29 and the standard deviation was 0.74. These mean scores are also indicated in **Figure 7.1**.
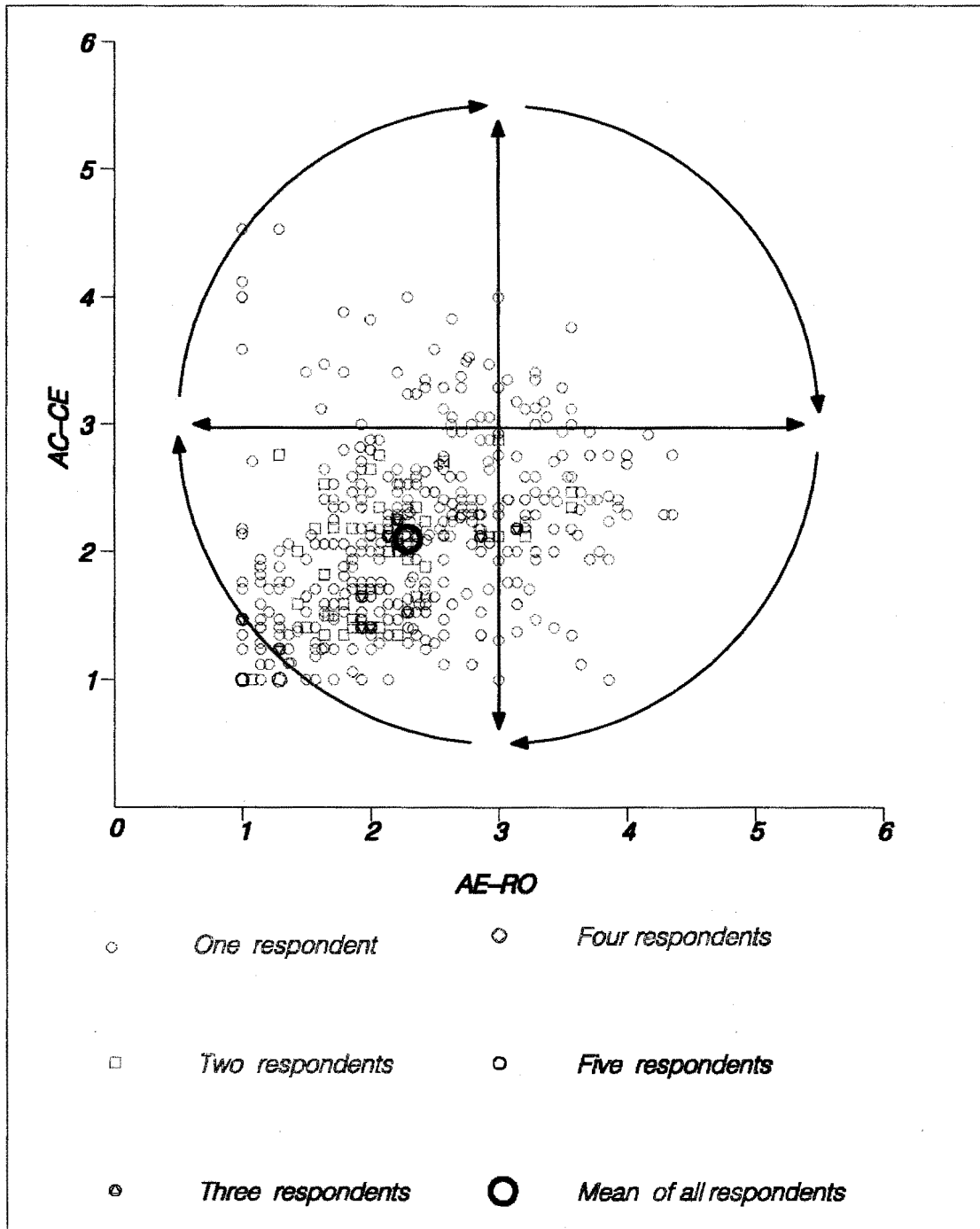
Figure 7. 1 Factor analysis of learning styles of respondents (N=473)

The findings depicted in **Figure 7.1** differ from other research studies on nursing students using the Kolb model of experiential learning. In the majority of studies reviewed the nurses were found to have predominantly concrete learning styles and therefore were either divergers or accommodators (Haislett et al. 1993:64; Hodges 1988b:342; Laschinger & Boss 1984:375-380; Laschinger 1986:292; Laschinger 1992:110).

The dominant learning abilities of the converger are abstract conceptualisation and active experimentation. Their strengths lie in problem solving, decision making and the practical application of ideas. A person with this learning style seems to do best in situations where there is a single correct answer or solution to a question or problem (Kolb 1984:77, 84-85). (See section 2.3, chapter 2)

Since learning is a lifelong process and knowledge is gained at work as well as in the classroom, there is reason to suspect a similar uniform correlation between learning styles and career paths. A professional career choice exposes one to a specialised learning environment as well as to a generic professional problem. One becomes a member of a group of professional peers. Habits acquired through professional training and immediate normative pressures shape one's learning style (Kolb 1984:88; Laschinger 1986:289).

According to Kolb (1984:90) nursing practitioners are clearly concrete learners and fall mainly into the diverger category but also into the accommodator quadrant. However, the task demands and pressures of a person's current job role have an influence on the learning style and tend to shape that person's adaptive orientation (Kolb 1984:90). It is also said that when learning styles match the demands of a given career specialisation, higher performance results (Kolb 1984:165).

Laschinger (1986:292; 1992:112) describes nursing as multi-dimensional and suggests this to be the reason for the different learning style profiles emerging in research. She also maintains that nursing, like medicine as a discipline, necessitates opposing learning orientations, namely the concrete people-oriented component and the active use of

scientific principles in practice. These opposing learning orientations imply divergence as well as convergence.

It is therefore suggested that the problem solving skills required from nursing practitioners, also require a convergent learning orientation. Another specific task and important aspect of a nursing practitioner's competencies is decision making. She often has to choose the best solution to a problem, set goals and make immediate decisions in a specific situation. These skills are associated with a convergent learning style (Kolb 1984:94-95; Laschinger 1992:105). Kolb (1984:206) also maintains that students shift in their preferences for learning styles from more concrete to more abstract and from more reflective to more active.

It is suggested that the findings plotted in **Figure 7.1** reflect the respondents' perception of the importance of practical application of theory in nursing environments. It is also suggested that the respondents, having experienced multiple learning modes, are able to adapt to continued and unguided learning situations.

The results depicted in **Figure 7.1** appear to suggest that further investigation into the learning styles of the Unisa nursing students as well as of different groups of nursing students is necessary.

7.6   LEARNING STYLE AND ACADEMIC ACHIEVEMENT

In the context of this research project, academic achievement reflects only the success of the respondents in the end of the year examination and not their professional progress in the practical domain. These respondents were well equipped to cope with academic studies, as described in the analysis of their demographic and academic profile (see chapter 6).

The end of the year examination results used to reflect the academic achievement of the respondents were those obtained in the following subjects:

- Nursing Ethos and Professional Practice (NEPEXAM)

- Nursing Administration (NUAEXAM)

- Nursing Education (NUEEXAM)

- Community Health Nursing (CNUEXAM)

The respondents were all students registered for at least one of the third year subjects listed above. All four of these subjects consist of three papers in the end of the year examination. The mean of the examination results of the three papers of a particular subject was used to correlate with their learning styles. Each subject therefore only had one score which was used in the correlation.

The Pearson product moment correlation coefficient was used to determine whether a correlation existed. No significant correlation was found between the learning styles and the academic achievement of the respondents.

Correlations were subsequently computed for the two factors and the mean group scores of the examination results of the four listed subjects. These correlations are depicted in **Table 7.3** below.

The means and standard deviations of the examination results of each subject are represented in **Table 7.3**. The correlations between the two factors of the Learning Style Questionnaire and the mean group scores of the examination results of each subject are also indicated in this table.

Table 7. 3 Correlations of the Learning Style Questionnaire factors with
examination results

Factors	Examination Results			
	NEPEXAM (N=19)	NUAEXAM (N=444)	NUEEXAM (N=357)	CNUEXAM (N=531)
Factor 1 AC - CE	0.36 (0.13)'	0.02 (0.67)'	-0.007 (0.88)'	-0.07 (0.11)'
Factor 2 AE - RO	0.36 (0.13)'	-0.03 (0.47)'	0.05 (0.33)'	-0.004 (0.92)'
'p - value				

As can be seen from **Table 7.3**, it is obvious that the mean group scores of the subjects are very close to each other. This supports the assumption made in the introductory chapter that there is no difference in the level of difficulty of the listed subjects (see section 1.7, chapter 1).

The finding that no correlation existed between the learning styles and academic achievement of the respondents supports other studies where similar correlations were investigated (Blagg 1985:94; Leiden, Crosby & Follmer 1990:395; Ostrow 1986:154; Talarczyk 1989:265). In all the above mentioned studies no or only low non-significant correlations could be identified between the learning styles of the respondents and their academic achievement.

Blagg (1985:94) does however suggest that if the teaching method matches the learning styles of the students, they will be more successful. Garity (1985:15) also reports that achievement is enhanced when instructional styles are compatible with learning styles.

No significant correlation was found between the examination results of the four different subjects. This might explain why no correlation was found between the learning styles and academic achievement of the respondents. The question whether the existing methods of evaluation for the subjects do justice to the students' academic performance should perhaps be asked.

A fairly large number of the respondents were registered for more than one third year subject in 1993 (see **Table 5.2**, chapter 5). The initial plan was to calculate a mean group score for those respondents who were registered for more than one subject by using the examination results of each of the listed subjects they were registered for. This score would have been used to correlate the learning style and academic achievement of each respondent. Because no significant correlation was found between the examination results of the different subjects, the correlation between the learning style and results for each subject a respondent was registered for, was computed separately.

7.7   LEARNING STYLE AND DISTANCE TEACHING

In the previous chapter the preference the respondents had for the Unisa method of tuition was discussed. The majority of the respondents indicated that they preferred distance teaching to other methods of teaching (see section 6.3.3, chapter 6).

To determine whether a correlation existed between the preferences for the Unisa method of tuition and the learning styles of the respondents, the t-test procedure was performed.

On factor one (AC-CE) the respondents who indicated that they preferred the Unisa method of tuition ($m=2.03$; $s=0.64$; $t=-4.11$; $p=0.00$) were higher on the abstract conceptualisation polar of the factor than those who did not prefer this method ($m=2.36$; $s=0.66$; $t=-4.19$; $p=0.00$).

On factor two (AE-RO) no significant difference could be found between the respondents who preferred the Unisa method of tuition (m=2.28; s=0.75; t=-0.65; p=0.51) and those who did not (m=2.33; s=0.74; t=-0.65; p=0.51).

It is concluded that those respondents who preferred the Unisa method of tuition were even more convergent in their learning style than those who did not prefer the Unisa method of tuition.

7.8   LEARNING STYLE AND HOME LANGUAGE

From the analysis and description in chapter 6 it is clear that the majority of the respondents had a home language other than the two official languages used at Unisa. Most of these respondents had a Black home language (see section 6.2.2, chapter 6).

Luthuli et al. (1992:30, 33) argue that the Black nursing student comes from a different educational background influenced by traditional practices of education. These traditional practices restrict their thinking and influence their process of learning. They embark on the nursing course with a limitation because they come from a different educational background. They then have to adapt and internalise the sub-culture of nursing and the professional role and use technical medical terms, all in a foreign language.

In an attempt to determine whether the respondents with a Black home language had significantly different learning styles from those who indicated their home language to be Afrikaans or English, the t-test procedure was performed.

The analysis done on factor one (AC-CE) showed that the respondents with a Black home language were higher on the abstract conceptualisation polar of this factor (m=2.03; s=0.62; t=3.30; p=0.00) than those with Afrikaans or English as a home

language (m=2.24; s=0.72; t=3.12; p=0.00). No significant differences could be found on factor two (AE-RO).

It can thus be concluded that those respondents with a Black home language had learning styles that were higher on the abstract conceptualisation mode of experiential learning and were thus more convergent.

7.9 DISTANCE TEACHING AND THE PERCEPTION OF THE UNISA NURSING COURSE

In the first section of the research instrument, the respondents were asked about their preference for the Unisa method of tuition. They were also asked about their perception of the Unisa nursing course. The analysis of these questions was discussed in the previous chapter (see section 6.3.3 and section 6.4, chapter 6).

Using the data obtained in the first section of the questionnaire, a correlation was examined between the preference for the Unisa method of tuition and the perception of the Unisa nursing course. The Chi-square test was performed.

From **Table 7.4** it is clear that a significant correlation exists between the preference for the Unisa method of tuition and the way in which the respondents experienced the course. The Chi-square value is highly significant (X^2=30,98; p=0.00). In particular, it appears that the respondents who preferred the Unisa method of tuition, also experienced the Unisa nursing course more positively than those who did not prefer the Unisa method of tuition.

Table 7. 4 Cross tabulation of frequencies of method of tuition with course experiences (N=461)

Unisa method of tuition	Perception of course					
	Very Negative	Negative	Neutral	Positive	Very Positive	Total
	f	f	f	f	f	f
Prefer	5 (1.33)	51 (13.64)	186 (49.73)	108 (28.88)	24 (6.42)	374 (100.0)
Do not prefer	10 (11.49)	19 (21.84)	40 (45.98)	13 (14.94)	5 (5.75)	87 (100.0)
Total						461

$X^2 = 30.98$

$P = 0.000$

( ) Row percentage, For example 1.33=5/374 x 100

The majority of the respondents (318, 85.03 percent) who preferred the Unisa method of tuition were neutral, positive or very positive about the Unisa nursing course.

Of the 87 respondents who did not prefer the Unisa method of tuition 69 respondents (79.31 percent) were very negative, negative or neutral about the Unisa nursing course. Only 18 (20.69 percent) of the respondents who did not prefer the Unisa method of tuition had experienced the Unisa nursing course as positive or very positive.

7.10 CONCLUSION

By using different techniques for statistical analysis information regarding the learning styles of the respondents was processed. The Learning Style Questionnaire was found to be valid and reliable. Items which described the two identified bipolar learning modes best, were extracted and used in the final processing of the Learning Style Questionnaire.

It can be concluded that the predominant learning style was the convergent learning style. The respondents were classified to be high on the abstract conceptualisation and active experimentation learning modes. The respondents with a Black home language were found to be more convergent than those with Afrikaans and English as home languages. No significant correlation was found between the learning styles of the respondents and their academic achievement which supports the findings of other similar studies. In correlating the learning styles with distance teaching, the respondents who preferred the Unisa method of tuition (distance teaching) to other methods, were also found to be more convergent.

In analysing the relationship between the respondents' preference for the Unisa method of tuition and their perception of the Unisa nursing course it can be concluded that a significant correlation existed between the Unisa method of tuition and the respondents' experiences of the Unisa nursing course.

In the last chapter a summary of the most significant findings and the conclusions drawn will be discussed. Various recommendations will be presented. Limitations identified during this research project will also be indicated.

■ ■ ■

CHAPTER 8

SUMMARY OF FINDINGS, CONCLUSIONS, LIMITATIONS AND RECOMMENDATIONS

8.1   INTRODUCTION

In this chapter the research questions are answered by summarising the most significant findings and conclusions of this study. Limitations which were identified during the study are discussed. Recommendations for further research, quality improvement in nursing education and support to Unisa nursing students are made.

8.2   AIM AND METHOD OF THE STUDY

The aim of this research project was to describe the learning styles of Unisa nursing students. Learning style theory provides a strong theoretical framework for depicting how individuals process information and prefer to learn. Knowledge of the learning styles of nursing students is useful for nurse educators to facilitate planning and designing learning activities to maximise learning and therefore academic achievement. It is necessary to have a wide knowledge of and insight in distance teaching students in order to understand the uniqueness of these students.

In order to achieve this aim a postal survey by means of a questionnaire was undertaken. The questionnaire consisted of two sections. The first section was comprised of questions regarding the demographic and academic profile of the respondents and their level of motivation. The second section of the questionnaire consisted of the Marshall and Merritt Learning Style Questionnaire, which was included to determine the learning styles of the respondents according to the Kolb model of experiential learning.

As this was a descriptive correlational study, no specific hypotheses were formulated. Research questions were formulated to direct the study. They were:

- Who is the Unisa nursing student?

- What are the learning styles of Unisa nursing students?

- How does the learning style of the student affect academic achievement?

- How can Unisa nursing students be supported in reaching the highest level of academic achievement at a distance teaching university?

The correlational component of the research project was comprised of correlations between constructs of interest. They were:

- Learning style and academic achievement;

- Learning style and distance teaching;

- Learning style and home language; and

- Distance teaching and perception of the Unisa nursing course.

The analysis of these correlations were done by using various statistical methods.

8.3 FINDINGS AND CONCLUSIONS OF THE RESEARCH PROJECT

The findings and conclusions of the survey are summarised according to the research questions which were formulated in the introductory chapter.

8.3.1 Who is the Unisa nursing student?

Aim: To describe Unisa nursing students with special emphasis on their demographic and academic profile

- Age

The mean age of the respondents (40.26) supports the description of Unisa nursing students as non-traditional students. These older students usually have pressing social, family and professional commitments to contend with, apart from their student commitments.

Previous research did not support the proposition that age accounts for differences in learning styles (Merritt 1983:371). It did however suggest that non-traditional students differ from traditional students with regard to support in the learning situation in that non-traditional students need more assistance in the learning situation (Merritt 1983:371).

- Home language

The majority of the respondents in this research project have a home language other than Afrikaans or English, which are the two official languages used at Unisa (**Figure 6.1**).

As cultural background is said to have an influence on thinking and the process of learning, a correlation was drawn between learning styles and home language. It was concluded that the respondents with a Black home language were more convergent than those with Afrikaans or English as a home language.

● Employment status

A high percentage of the respondents were employed as professional or senior professional nurses (**Table 6.2**). Nearly all the respondents were employed full-time (**Figure 6.2**). These posts bring along difficult circumstances like irregular working hours which will again influence their study programme (**Table 6.3**). The unique working situation of Unisa nursing students will thus affect their planning of study time or study programmes.

● Academic qualifications

It has been shown that many of the respondents in this research project held more than the minimum qualifications (**Figure 6.3; Table 6.4**). Some of the respondents had probably been unable to acquire an academic qualification in nursing either due to lack of facilities in earlier years or because they were unable to attend a residential university.

Many of the respondents are or are becoming highly qualified with many years of study experience. It also means they should be able to demonstrate a diversity of skills and expertise in the professional domain. There seems thus to be a trend for a large number of Unisa nursing students to strive to develop themselves as well qualified practitioners.

The fact that the majority of the respondents had six years or more study experience after school (**Table 6.7**), supported the description of Unisa nursing students as experienced learners. This does however not mean that Unisa nursing students do not have a need for support in the learning process.

- Duration of their study

It took more than half of the respondents six years or longer to reach the third year stage of this BA(Cur) course (**Table 6.10**). Professional and personal responsibilities play a definite role regarding the time available for studies.

Unisa nursing students seem to be realistic in rating their capabilities with regard to the workload they can handle as students (**Table 6.11**). However, the number of hours devoted to their studies in an average week (**Table 6.12**), is still less than has been suggested by other researchers of Unisa students.

Non-traditional students, as experienced learners, should know the importance of a carefully devised study programme. Only approximately half of the respondents indicated that they study according to a study programme (**Figure 6.7**). From the literature it is suggested that studying according to a programme, could affect academic achievement positively.

- Responsibilities of the respondents

The Unisa nursing students as non-traditional learners have numerous commitments which have an impact on the course of their study. Apart from their daily professional responsibilities, most of the Unisa nursing students have other professional activities influencing their study programmes (**Table 6.13**). These activities include work-related meetings, fieldwork and work-related travelling, involvement in professional organisations and attendance of meetings and symposia. Some of the respondents however felt that these additional activities made a positive contribution to their Unisa studies. The professional responsibilities of Unisa nursing students should give some idea of the contribution the respondents have made to the profession.

The personal responsibilities of non-traditional students are numerous. The mere fact that nearly all the respondents had dependants who needed their attention daily, placed an even higher pressure on these students.

- Motivation of the respondents

Reasons for doing the Unisa nursing course, were mainly positive. The majority of the respondents had a sincere desire to obtain the specific qualification (**Table 6.14**). Very few respondents showed a nonchalant attitude towards their studies.

Although most of the respondents were strongly motivated to reach success, a fairly big proportion of the respondents were in doubt about their ability to complete the course successfully (**Figure 6.12**). The reasons for their uncertainty, were mainly personal, like financial problems, lack of support at home, advanced age and domestic problems (**Table 6.16**). Sociology was the one subject that was repeatedly regarded as a difficult subject. A number of the respondents specifically indicated that Sociology had to be repeated a few times and that this demotivated them. It was also said that some of the sections of this subject were not applicable. This is thus not consistent with the assumption made in chapter 1, section 1.7 that subjects on the same year level are considered to be equivalent. The overall motivation of the respondents was however positive.

The Unisa nursing course was mostly experienced as neutral, positive or very positive (**Table 6.17**). In expressing their overall perception of the course, valuable comments were made which have been used to make recommendations. As in a previous study on Unisa nursing students, the comments also reflected "a tremendous amount of goodwill, which is very heartening" (Brownlee 1982:233). The study material was described as being of a high quality. The educational approach was said to be suitable for adults with their special and specific needs and circumstances. Lecturers were praised for their interest in and support to the students. However, many respondents indicated the availability of the lecturers to be a major problem.

- Conclusion

The Unisa nursing students are adult learners who come into the university with an extensive life experience, with practised academic skills of their own and with aspiration of self-fulfilment. It is thus of interest to nurse educators to know that Unisa nursing students are not school leavers who are still conditioned to a pedagogical mode of learning.

In conclusion it can be said that the Unisa nursing student population is a selected group of nurses who have chosen to further their education after their basic training. Considering the fact that the respondents in this research project were motivated to further their education, it is suggested that Unisa nursing students are aware of the importance of skills like building conceptual models, testing theories and ideas, seeking and exploiting opportunities, and leading and influencing others. They can be described as a group of nurses that look further than the traditional view of the nurse as a doer and follower of orders.

8.3.2 What are the learning styles of Unisa nursing students?

Aim: To determine the learning styles of Unisa nursing students according to the Kolb model of experiential learning

The learning styles of the majority of the respondents are classified as convergent where the dominant learning abilities are abstract conceptualisation and active experimentation. Problem-solving, decision making and practical application of ideas are the converger's strengths. Convergers value precision and seem to do best where there is a single correct answer to a question or solution to a problem.

In other research done on the learning styles of nursing students, they were found to have predominantly concrete learning styles and therefore were divergers or

accommodators. These two learning styles are said to be typical of people in a people-oriented profession like nursing.

It has to be accepted that students who study through distance teaching will differ in their learning styles but that distance teaching may necessarily force the students to adapt their learning styles to this method of tuition. To be able to support Unisa nursing students in their uniqueness, a thorough knowledge of a profile of these students is necessary. It is also likely that the findings of this research project are a reflection of the career stage of the respondents who are at this stage classified as experienced learners and well-trained nursing practitioners. It is also said that nursing necessitates opposing learning orientations, namely the concrete people-oriented component and the active use of scientific principles in practice, which imply divergers as well as convergers (Laschinger 1986:292).

It can be concluded that the Unisa nursing student is a student who has a strong interest in theory and analytical problem solving. These students have thus decided to develop themselves academically apart from being well-trained nursing practitioners.

8.3.3 How does the learning style of the student affect academic achievement?

Aim: To determine whether there is any relationship between the learning styles and the academic achievement of the students.

When the learning styles of the respondents were correlated with their end of the year examination results, no significant correlation was found between these two constructs. In other studies where similar correlations were investigated, it was also found that no significant correlation existed between learning styles and academic achievement.

8.3.4 How can Unisa nursing students be supported in reaching the highest level of academic achievement at a distance teaching university?

Aim: To determine whether there is a difference between how the students learn and how they would want to learn as well as how distance teaching relates to the learning styles of Unisa nursing students.

It is concluded that distance teaching fulfils the needs of the non-traditional learner for tertiary education, as a high percentage of the respondents found the Unisa method of tuition preferable to other methods (**Figure 6.4**).

The respondents found that studying according to their own needs and the time available was suitable. However, financial and domestic problems encountered during their study years were mentioned to be problems. Financial assistance to students has recently become a major issue that is being addressed by the Department of Student-Community Liaison of Unisa (Meet Thandi Ngengebule 1995:11).

Positive aspects regarding their Unisa studies included the comprehensiveness of the study material, such as study guides and tutorial letters as well as the helpfulness of the lecturers. They also felt that distance teaching fulfils their needs as adult learners. On the other hand, some respondents encountered negative experiences regarding the availability and approachability of the lecturers. Feelings of isolation were expressed. The researcher is convinced that Unisa's vision to reach out to its learners by establishing learning centres all over South Africa, will address the need for more contact between student and lecturer (Unisa Learning Centres 1995:10).

A correlation was drawn between learning styles and distance teaching. Respondents who preferred distance teaching as method of tuition were more convergent than those who did not prefer this method of tuition. It was thus concluded that the convergent learning style relates well to distance teaching. It should however also be accepted that the possibility exists that distance teaching can force the students to adapt their learning styles to fit distance teaching.

Students should be put on the road to self-discovery and growth. Those with learning styles less compatible to distance education and who find this teaching method difficult to manage should be helped to understand how their learning styles contribute to the different approaches to problem-solving. If necessary, useful elements of other learning styles could be employed within their own learning styles or a level of competence in some elements could be actively gained.

Nurse educators should be sensitive to student individuality which is expressed in different learning styles. They must therefore plan for the diversity of student learning styles by preparing the learning material in such a way that it will meet the needs of a wider range of students with diverse learning styles more effectively. Flexibility and the willingness to adapt the teaching material to different individual needs, may allow the student to achieve more easily, and consequently, less stressful.

8.4   LIMITATIONS IDENTIFIED DURING THE STUDY

During the course of the study certain limitations were identified. Some of these limitations offer scope for further research. The most important limitations are:

- No information was found on the learning styles of nursing students in South Africa. Unisa nursing students as non-traditional nursing students could therefore not be compared to other traditional nursing students in terms of their learning styles.

- No recorded information was found on the learning styles of the Unisa student population classified by a learning style model. The learning styles of Unisa nursing students could therefore not be described against the background of learning styles of other Unisa students.

- When the examination results of the respondents were used to correlate their learning styles with the level of academic achievement, the average mark obtained in a specific subject was used. The average mark did not indicate the different marks

obtained in essay type questions and objective item questions. According to the literature students with certain learning styles within the Kolb model of experiential learning perform differently on certain types of questions, like objective item questions (Markert 1986:781).

8.5   RECOMMENDATIONS ARISING FROM THE RESEARCH PROJECT

The results of this descriptive correlational study are potentially useful for nurse educators and nursing education research.

- Student individuality expressed in learning styles is a reality. It is thus strongly recommended that all nurse educators recognise, accept and take into account that students learn differently.

- No learning style is either better or worse than another. A student must not be labelled or stigmatised because she has a particular learning style. No learning style has different intelligence ranges (Dunn, Beaudry & Klavas 1989:56). How the student learns, is important to the educator. For a nurse educator to understand the individual differences of her students' learning styles, she also has to know what her own learning style is. The educator's own predominant learning styles will influence the selection and presentation of learning strategies and material. Staff development is therefore recommended in knowledge and understanding of own as well as others' learning styles.

- The use of learning style questionnaires in admission procedures is a first step to encouraging nurse educators to become more sensitive to student individuality. It may also help them to identify learning gaps.

- Nurse educators should look critically into the ways in which nursing students have been taught. They should reach the understanding that there is no single right way to learn or best way to teach.

- It is recommended that nurse educators find ways to enhance their sensitivity to the individual learning styles of their students and to consider how best these can be addressed by compiling flexible learning material and by the deployment of a variety of teaching strategies. Provision should be made in the didactic design of curricula to fit the learning styles of individual students.

- It is recommended that the conference telephone as a medium for student counselling be used to its full potential, as this learning medium has been described as being successful in distance teaching (Adey & Barnard 1992:59).

- It is recommended that investigation into the evaluation criteria of the nursing subjects be conducted to determine whether the existing methods of evaluation do justice to the students' academic performance.

8.6   RECOMMENDATIONS FOR FURTHER RESEARCH

- In the final analysis of the Marshall and Merritt Learning Style Questionnaire some of the items of the questionnaire were excluded on statistical grounds. Using data of the statistical analysis of this research project, a new refined questionnaire will be developed by the researcher for further research on learning styles.

- It is recommended that the newly developed learning style questionnaire be translated into all eleven official languages of this country to enable most of the nursing students to complete the questionnaire in their first language. This should make no difference to the analysis of the questionnaire as the responses are coded

according to the appropriate letter choice for each word pair contained in the list of forty items.

- As no other profile of the learning styles of nursing students in this country has been recorded, further research is recommended. A sample including different groups of nurses would be useful. Learning gaps may be identified which may facilitate learning and development of all learning competencies.

- A similar study that includes university nursing students from several different nursing programmes, is also recommended.

- It is suggested that more emphasis is put on the principle of individual differences in learning styles in the initial nursing education courses, and as early as possible. It is therefore recommended that research into the nursing education curricula be conducted to determine whether learning styles are sufficiently emphasised in the curriculum.

8.7   RECOMMENDATIONS FOR QUALITY IMPROVEMENT IN NURSING EDUCATION

Research on learning styles may contribute to quality improvement in nursing education.

Nurse educators can contribute to the nursing profession by improving their teaching and therefore contributing to the body of scientific knowledge of nursing education. It will also improve the chances of success at educating a diverse student population.

- Current economic changes in the health care sector will have tremendous impact on nursing and nursing education. In a shrinking economy, nationwide, but particularly in health care, the future will belong to those who can successfully anticipate problems, build information networks, and create bridges of shared resources with other

disciplines. Continuing study of nurses' learning styles, with emphasis on their strengths and limitations, could provide valuable information to nurse educators. These nurse educators can assist greatly in addressing the important task of reordering priorities in nursing education and thus in health care.

8.8   RECOMMENDATIONS FOR SUPPORT TO UNISA NURSING STUDENTS

- In nursing education there is a relationship between the lecturer and the student. For this to be a didactic relationship and to be successful, the interaction between the lecturer and student must be according to the parameters of adult education. Adult learning involves the use of a learning process in which a suitable environment for learning is established, the learner is involved, learner's needs are identified and learning experiences are provided to meet these needs (Quinn 1988:48). The adult learner experiences a maturation process which is a lessening of dependence and a strengthening of selfdirectedness. The learner is thus provided with a means by which she may teach herself. The self-directed learning adult as a student tends to develop an even more individuated learning style (Cleverly 1994:437). It is thus recommended that Unisa nursing students are supported in such a way that their rightful partnership in this relationship be adhered to.

- The nature of the educational task is such that the educator is partly responsible for the way in which students learn as well as the outcome of learning.

- The system of experiential learning takes into account that individual students have different levels of study experience (Steyn 1994:47). Unisa nursing students, as experienced learners, will thus need different amounts of support, which must be decided by themselves. It is recommended that support to students is given according to their own individual needs.

- An assessment of learning style should be done early in a student's academic experience. They could then be sensitised to the attendant strengths and

weaknesses of their particular learning style through a workshop or orientation course.

- It is recommended that Unisa nursing students are encouraged and supported in planning and compiling study programmes according to their specific professional and personal circumstances.

8.9   PROPOSED COURSE ON LEARNING STYLES

A course on learning styles, in the form of a workshop or orientation course, is planned by the researcher to make both learners and educators aware of this important individual characteristic.

The aims for the course on learning styles are:

- to explain the concept of learning styles;

- to identify own patterns of learning;

- to appreciate individual differences in learning styles;

- to increase understanding of information and performance levels;

- to enable learners to accept their strengths and weaknesses;

- to assist individuals to capitalise on their strengths and to enhance their ability to learn;

- to inform people of potential problems due to weaknesses of a particular learning style;

- to provide a learning environment sufficiently flexible to contain differences in learning styles.

The workshop will be planned in such a way that the specific needs of nursing students, nursing practitioners and nurse educators are adhered to. The groups can be divided according to these needs. A joint group discussion eventually (at the end of the workshop) will make others aware of the specific needs and problems of other groups.

8.10   CONCLUSION

Individuals deserve to be taught in a way that best suits their needs. It is hoped that this research project carries out a clear message that it is important for educators to become more aware of each student as an individual learner.

In conclusion, the researcher wants to put forward a plea to all educators in the words of the Vice Principal (Tuition) of Unisa, Professor Simon Maimela:

> ... I want to invite all academic staff to become actively involved ... in a student-centered approach to all tuition at Unisa. To attain those objectives, all of us must do ... analysis in order to develop an adequate and realistic profile of Unisa students, one which will help us understand the students' needs, their circumstances and social contexts all of which must be addressed meaningfully in our study materials (Maimela 1994:111).

■ ■ ■

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Zimbabwe's postal workers on strike. 1994. *The Star,* 17 February:9.

■ ■ ■

Appendix A

Permission to use Marshall and Merritt

Learning Style Questionnaire

Department of Medical-Surgical Nursing (M/C 802)
College of Nursing
845 South Damen Avenue, 7th Floor
Box 6998, Chicago, Illinois 60680
(312) 996-7900

October 30, 1990

TO: Hilla Brink

FROM: Sharon L. Merritt, Ed.D., RN

SUBJECT: Learning Style Questionnaire, 1985

A sample copy of the form you requested is enclosed. Permission is granted for you to use the form under the following conditions:

1. The instrument is used only for your research project.

2. Use of the instrument and all relevant publications by Dr. Marshall and I are correctly cited in your research.

3. If the questionnaire is used as part of the instrumentation for your research, the section containing the LSQ are fully cited with authors' names and addresses, and the following phrase;

   "Permission granted to *G. H. van Rensburg* for exclusive and sole use in his/her research project."

4. Upon completion of the study, we receive a copy of all raw data collected in your study.

5. If publication(s) result(s) from your study, we receive full and complete credit as authors of the LSQ.

6. Reprint(s) of article(s) that include(s) discussion of results using the LSQ are forwarded to us.

Your agreement to these conditions for use of the LSQ is indicated by your signature below and return of this form to Dr. Merritt at the address above. Upon receipt of the signed form a copy of the scoring instructions will be forwarded to you.

SIGNATURE: _____

NAME: _____ G. H. van Rensburg _____ H.-I. L. Brink _____

ADDRESS: ____ Department of Nursing Science _____

_____ Unisa _____

_____ P.O. Box 392 _____ Pretoria _____

TITLE OF PROPOSED RESEARCH: ___ The learning styles of

nursing students at a distance teaching

university

Appendix B

English and Afrikaans Questionnaires
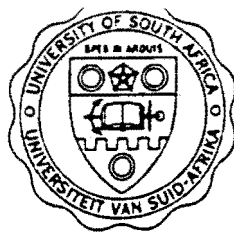
Dear Student

As lecturers of Unisa we regard the learning needs of our students as extremely important, and therefore we constantly conduct research in order to improve our help and assistance to students.

Each student has a unique learning style. To attain maximum academic achievement, it is essential that each student is allowed to learn according to his/her own preference. It is also important for the lecturer to know what the student's preferred style of learning is, and to adapt study material to suit these preferences.

I am currently undertaking a research study regarding the learning styles of Nursing Science students at Unisa, which will form part of the degree MA(Cur). The purpose of this study is to enhance and expand our assistance to students.

All students who registered in 1993 for a third year course in the Department of Nursing Science, form part of this research group. By providing us with information regarding your experience of the learning process, you can make a valuable contribution to the research project, which will be of great benefit to and promote the achievement of our students.

A questionnaire and addressed return envelope is included with this letter. I assure you that all information will be treated as strictly confidential. The student number is only included for administrative purposes. **Please mail the completed questionnaire within a week after you have received it.** If you prefer not to complete the questionnaire, may I kindly request that you return the uncompleted questionnaire in the provided envelope.

I realise that your time is valuable, but since you were a senior student in 1993, your contribution to this study will be sincerely appreciated and of much value for the lecturers and students of this department.

If you wish to obtain more information, please feel free to contact me at Tel.(012) 985527.

My sincere thanks for your contribution.

G.H. van Rensburg

For office use

| |
| |

QUESTIONNAIRE
LEARNING STYLES OF THE UNISA NURSING STUDENT

Please answer all the items. Place a mark in the appropriate block or give a written answer where applicable.

SECTION ONE

1.1 What is your age?	Years

1.2 Home language	
Xhosa	
Zulu	
English	
Afrikaans	
South Sotho	
North Sotho	
Tsonga	
Ndebele	
Swati	
Venda	
Tswana	
Other (specify)	

1.3 Post held	
Professional nurse	
Nursing educator	
Nursing service manager	
Full-time student	
Other (specify)	

1.4 Do you work full-time or part-time?	
Full-time	
Part-time	

1.5 Working hours	
Office hours	
Day duty	
Night duty	
Day and night duty	
Irregular shifts	
Other (specify)	

1.6 Indicate your registration with the South African Nursing Council	
General nursing	
Midwifery	
Psychiatric nursing	
Community health nursing	
Nursing education	
Nursing administration	

Other (specify................................

....

1.7 In which year did you qualify as a registered nurse?	19 ....

| 1.8 | For how many years did you <u>not</u> study prior to starting the BA(Cur) degree? | Years | |

| 1.9 | Indicate the number of study years after school. | Years | |

1.10	Do you find the Unisa method of tuition preferable to other methods of tuition that you have experienced?	YES	NO
	Would you care to comment on this?		
	....		

During 1993 you were registered for a third year course in the Department of Nursing Science at Unisa.

| 1.11 | Was it the first time you registered for the subject? | YES | NO |

| 1.12 | Was the subject successfully completed? | YES | NO |

1.13	Were you registered for more than one third year subject within the Department of Nursing Science in 1993?	YES	NO
	Please specify		
	....		

| 1.14 | For how many years have you been registered at Unisa for this BA(Cur) degree? | Years | |

1.15	How many subjects or modules do you think you can cope with per year?	Subjects	Modules

1.16	How much time can you devote to your studies in an average week?	Hours

1.17	Do you study according to a study programme?	YES	NO

1.18	Do any other <u>professional</u> activities influence your study programme?	YES	NO
	Would you care to comment on this?		

1.19	Do any <u>personal</u> activities influence your study programme?	YES	NO

1.20	Do you have any dependents (children, parents) who need your attention at home?	YES	NO
	If the answer is YES, how much time is devoted to the dependent(s) per day?	Hours	

1.21	Indicate your reason/reasons for doing the BA (Cur) degree.	
	A sincere desire to obtain the specific qualification	
	It is expected of me	
	To qualify for promotion	
	To obtain a post with more suitable conditions of service	
	No specific reason	
	Other (specify)	

1.22	How motivated are you to achieve success with this course?	
	Strongly motivated	
	Motivated	
	Don't care	

1.23	Were you at any time in doubt whether you would be able to complete the course successfully?	YES	NO
	If the answer is yes, would you care to give the reason/s		
	....		
	....		

1.24	How do/did you experience the BA(Cur) course?
	Please express your feelings, thoughts, experiences and/or grievances.
	....
	....
	....

SECTION TWO
LEARNING STYLE QUESTIONNAIRE

DIRECTIONS:

Following is a list of 40 word pairs. For each pair, decide which one of the two words is more characteristic of your learning style when compared to the other word. Then decide if the word describes what you generally prefer. If it is <u>most of the time</u>, then mark the extreme response, <u>A</u> or <u>E</u>, whichever is appropriate. If it is <u>over half of the time</u> but not most of the time, then mark the next response, <u>B</u> or <u>D</u>, whichever is appropriate. If you cannot decide between the two words, mark <u>C</u>. Using the answer sheet provided, blacken the appropriate letter choice for each word pair contained in the list.

The word to the <u>left</u> is characteristic of you	The word to the <u>right</u> is characteristic of you
<........A...............B.................C.................D............E.......>
GENERALLY OVER HALF ABOUT HALF OVER HALF GENERALLY	
(Most of the time) THE TIME THE TIME THE TIME (Most of the time)	

eg.

watching <.........(A.)........B..........C.............D...........E...> acting

The word to the <u>left</u> is characteristic of you	The word to the <u>right</u> is characteristic of you

<........A...............B...............C...............D...............E.......>

GENERALLY (Most of the time)	OVER HALF THE TIME	ABOUT HALF THE TIME	OVER HALF THE TIME	GENERALLY (Most of the time)

2.1 spontaneous..	A - B - C - D - E	.... questioning
2.2 observation..	A - B - C - D - E	.... participation
2.3 reserved.....	A - B - C - D - E	.... demonstrative
2.4 sensing......	A - B - C - D - E	.... thinking
2.5 premonition..	A - B - C - D - E	.... reason
2.6 active.......	A - B - C - D - E	.... reserved
2.7 participation	A - B - C - D - E	.... observation
2.8 watching.....	A - B - C - D - E	.... acting
2.9 observing....	A - B - C - D - E	.... doing
2.10 deliberate...	A - B - C - D - E	.... reason
2.11 acting.......	A - B - C - D - E	.... reflecting
2.12 perceptual...	A - B - C - D - E	.... intellectual
2.13 perform......	A - B - C - D - E	.... examine
2.14 emotional....	A - B - C - D - E	.... rational
2.15 consider.....	A - B - C - D - E	.... impulsive
2.16 operative....	A - B - C - D - E	.... watchful
2.17 reason.......	A - B - C - D - E	.... hunch
2.18 impulsive....	A - B - C - D - E	.... planning
2.19 produce......	A - B - C - D - E	.... watch
2.20 witness.....	A - B - C - D - E	.... exhibit

The word to the <u>left</u> is characteristic of you		The word to the <u>right</u> is characteristic of you
<......A...............B...............C...............D............E......>		
GENERALLY OVER HALF ABOUT HALF OVER HALF GENERALLY		
(Most of the time) THE TIME THE TIME THE TIME (Most of the time)		
2.21 feeling......	A - B - C - D - E	.... thinking
2.22 ponder.......	A - B - C - D - E	.... do
2.23 involved.....	A - B - C - D - E	.... distant
2.24 analytical...	A - B - C - D - E	.... emotional
2.25 intuitive....	A - B - C - D - E	.... reasoning
2.26 careful......	A - B - C - D - E	.... emotional
2.27 logical......	A - B - C - D - E	.... sentimental
2.28 perception...	A - B - C - D - E	.... reason
2.29 thinking.....	A - B - C - D - E	.... instinctive
2.30 hunch........	A - B - C - D - E	.... logical
2.31 passive......	A - B - C - D - E	.... active
2.32 doing........	A - B - C - D - E	.... watching
2.33 view.........	A - B - C - D - E	.... execute
2.34 resolving....	A - B - C - D - E	.... feeling
2.35 reflecting...	A - B - C - D - E	.... performing
2.36 intellectual.	A - B - C - D - E	.... emotional
2.37 reflective...	A - B - C - D - E	.... productive
2.38 evaluative...	A - B - C - D - E	.... sensitive
2.39 solve........	A - B - C - D - E	.... reflect
2.40 exercise....	A - B - C - D - E	.... view

Thank you for your contribution to this research project. Please be assured that all information will be treated as strictly confidential. Your identity will in no way be disclosed.
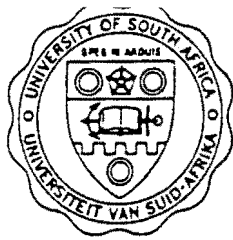
■ ■ ■

Geagte Student

As dosente by Unisa is die studiebehoeftes van ons studente vir ons na aan die hart, en word daar voortdurend navorsing gedoen ten einde hulp en ondersteuning aan studente te verbeter.

Elke student het sy of haar eie leerstyl. Om die student in staat te stel om die hoogste akademiese prestasie te behaal, is dit noodsaaklik dat die student volgens eie voorkeur leer. Dit is ook belangrik dat die dosent kennis dra van die student se voorkeure, en om studiemateriaal aan te pas volgens die studiebehoeftes van die student.

Ek is tans besig met 'n ondersoek na die leerstyle van Verpleegkundestudente aan Unisa, wat deel uitmaak van navorsing vir die graad MA (Cur). Die doel van die studie is om uiteindelik hulp en ondersteuning aan die studente uit te brei en te verbeter.

Alle studente wat in 1993 geregistreer het vir 'n derdejaarkursus in die Departement Verpleegkunde, is deel van die ondersoekgroep. Deur aan ons inligting te verskaf aangaande u leerproses, kan u 'n waardevolle bydrae lewer wat weer vir ander studente tot voordeel kan strek.

'n Vraelys en 'n gefrankeerde koevert is by hierdie brief ingesluit. Ek wil u verseker dat alle inligting as streng vertroulik beskou word - u studentenommer is slegs vir administratiewe gebruik. Stuur asseblief die **voltooide vraelys terug** binne 'n week na ontvangs. Indien u egter sou verkies om nie die vraelys te voltooi nie, word u versoek om die onvoltooide vraelys wel terug te stuur.

Ek besef dat u tyd baie kosbaar is, maar wil graag beklemtoon dat aangesien u in 1993 'n senior student was, u bydrae van groot waarde kan wees vir ander studente sowel as die dosente van hierdie departement.

Indien u enige navrae het, is u welkom om met my in verbinding te tree by Tel.(012) 985527.

By voorbaat dankie vir u waardevolle hulp en bydrae.

G.H. van Rensburg

Kantoorgebruik

VRAELYS
LEERSTYLE VAN DIE VERPLEEGKUNDESTUDENT AAN UNISA

Beantwoord asseblief <u>al</u> die items. Maak 'n merk in die betrokke
blokkie of gee 'n geskrewe antwoord waar toepaslik.

AFDELING EEN

1.1 Hoe oud is u?	Jare

1.2 Huistaal	
Xhosa	
Zulu	
Engels	
Afrikaans	
Suid-Sotho	
Noord-Sotho	
Tsonga	
Ndebele	
Swati	
Venda	
Tswana	
Ander (spesifiseer)	

1.3 Pos beklee	
Professionele verpleegkundige	
Verpleegdosent	
Verpleegdiensbestuurder	
Voltydse student	
Ander (spesifiseer)	

1.4 Werk u voltyds of deeltyds?	
Voltyds	
Deeltyds	

1.5 Werksure	
Kantoorure	
Dagdiens	
Nagdiens	
Dag- en nagdiens	
Ongereelde ure	
Ander (spesifiseer)	

1.6 Dui u registrasie by die Suid-Afrikaanse Raad op Verpleging aan	
Algemene Verpleegkunde	
Verloskunde	
Psigiatriese Verpleegkunde	
Gemeenskapsverpleegkunde	
Verpleegonderwys	
Verpleegadministrasie	

Ander (spesifiseer)...............................

....

1.7 In watter jaar het u gekwali- fiseer as geregistreerde verpleegkundige?	19 ....

1.8	Hoeveel jare onderbreking in studies het u gehad voordat u begin het met die BA(Cur) graad?	Jare

1.9	Dui die aantal jare aan wat u na-skools studeer het.	Jare

1.10	Vind u die onderrigmetode van Unisa beter as ander onderrig-metodes wat u al ervaar het?	JA	NEE
	Gee u kommentaar asseblief?		
	....		
	....		

Gedurende 1993 was u geregistreer vir 'n derdejaar kursus by die Departement Verpleegkunde aan Unisa.

1.11	Was dit die eerste keer dat u geregistreer het vir die kursus?	JA	NEE

1.12	Het u die vak suksesvol voltooi?	JA	NEE

1.13	Was u vir meer as een derdejaar-kursus geregistreer by die Departement Verpleegkunde in 1993?	JA	NEE
	Spesifiseer asseblief		
	....		
	....		

1.14	Vir hoeveel jare is u al geregistreer by Unisa vir die BA(Cur) graad?	Jare

1.15 Hoeveel vakke of modules dink u is u in staat om te hanteer per jaar?	Vakke	Modules

1.16 Hoeveel tyd kan u spandeer aan u studies in 'n gemiddelde week?	Ure

1.17 Studeer u volgens 'n studieprogram?	JA	NEE

1.18 Beïnvloed enige ander professionele aktiwiteite u studieprogram?	JA	NEE
Gee u kommentaar asseblief		

1.19 Beïnvloed enige persoonlike aktiwiteite u studieprogram?	JA	NEE

1.20 Het u enige afhanklikes (kinders, ouers) wat u aandag tuis verg?	JA	NEE
Indien die antwoord JA is, hoeveel tyd spandeer u aan u afhanklike/s per dag?	Ure	

1.21 Dui u rede/s aan waarom u die BA(Cur) graad doen.	
'n Opregte behoefte om die spesifieke kwalifikasie te behaal	
Dit word van my verwag	
Om te kwalifiseer vir bevordering	
Om 'n pos te bekom met beter werksomstandighede	
Geen spesifieke rede	
Ander (spesifiseer)	

1.22	Hoe gemotiveerd is u om sukses te behaal in hierdie kursus?	
	Sterk gemotiveerd	
	Gemotiveerd	
	Gee nie om nie	

1.23	Het u op enige stadium getwyfel of u wel die kursus suksesvol sal kan voltooi?	JA	NEE
	Indien u antwoord JA is, sal u asseblief u redes verstrek?		

1.24	Hoe ervaar u/het u die Ba(Cur) kursus ervaar?
	Beskryf asseblief u gevoelens, gedagtes, ervarings en/of griewe. ....

AFDELING TWEE
VRAELYS RAKENDE LEERSTYLE

"LEARNING STYLE QUESTIONNAIRE"

S.L. Merritt & J.C. Marshall 1985, University of Illinois, Chicago. Toestemming verleen aan G.H. van Rensburg vir uitsluitlike en alleengebruik in haar navorsingsprojek.

<u>AANWYSINGS</u>:

Vervolgens 'n lys met 40 woordpare. Vir elke woordpaar moet u besluit watter een van die twee woorde is meer kenmerkend van u leerstyl wanneer dit vergelyk word met die ander woord. Besluit dan of die woord beskryf wat u meestal verkies. Indien dit die <u>meeste van die tyd</u> is, merk die verste respons, <u>A</u> of <u>E</u>, wat ookal toepaslik is. Indien dit <u>meer as die helfte van die tyd</u> is, maar nie meeste van die tyd, merk die volgende respons <u>B</u> of <u>D</u>, wat ookal toepaslik is. Indien u nie kan besluit tussen die twee woorde nie, merk <u>C</u>. Gebruik die antwoordblad wat voorsien is en merk die toepaslike letterkeuse vir elke woordpaar in die lys.

Die woord na <u>links</u> is kenmerkend van u	Die woord na <u>regs</u> is kenmerkend van u
<...........A................B.................C.................D..............E.......>	
MEESTAL MEER AS DIE ONGEVEER DIE MEER AS DIE MEESTAL	
HELFTE VAN DIE HELFTE VAN DIE HELFTE VAN DIE	
TYD TYD TYD	

bv.

toekyk   <..........(A)..........B..........C..............D............E...> deelname

Die woord na <u>links</u> is kenmerkend van u			Die woord na <u>regs</u> is kenmerkend van u	
<.........A.................B.................C.................D.............E.......>				
MEESTAL	MEER AS DIE HELFTE VAN DIE TYD	ONGEVEER DIE HELFTE VAN DIE TYD	MEER AS DIE HELFTE VAN DIE TYD	MEESTAL
2.1 spontaan.....	A - B - C - D - E		.... bevraagteken	
2.2 waarnemend...	A - B - C - D - E		.... deelnemend	
2.3 terughoudend.	A - B - C - D - E		.... demonstratief	
2.4 aanvoeling...	A - B - C - D - E		.... denkend	
2.5 voorgevoel...	A - B - C - D - E		.... beredeneerd	
2.6 aktief.......	A - B - C - D - E		.... terughoudend	
2.7 deelnemend...	A - B - C - D - E		.... waarnemend	
2.8 toekyk.......	A - B - C - D - E		.... handel	
2.9 waarneem.....	A - B - C - D - E		.... uitvoer	
2.10 doelbewus....	A - B - C - D - E		.... beredeneerd	
2.11 aktief.......	A - B - C - D - E		.... nadenkend	
2.12 gewaarwording	A - B - C - D - E		.... intellektueel	
2.13 doen.........	A - B - C - D - E		.... ondersoekend	
2.14 emosioneel...	A - B - C - D - E		.... rasioneel	
2.15 weldeurdag...	A - B - C - D - E		.... impulsief	
2.16 werkdadig....	A - B - C - D - E		.... waaksaam	
2.17 beredeneerd..	A - B - C - D - E		.... op gevoel	
2.18 impulsief....	A - B - C - D - E		.... beplannend	
2.19 produktief...	A - B - C - D - E		.... kyk toe	
2.20 toeskouer....	A - B - C - D - E		.... demonstreerder	

Die woord na <u>links</u> is kenmerkend van u		Die woord na <u>regs</u> is kenmerkend van u	
<.........A...............B................C.................D..............E.......>			
MEESTAL	MEER AS DIE HELFTE VAN DIE TYD	ONGEVEER DIE HELFTE VAN DIE TYD	MEER AS DIE MEESTAL HELFTE VAN DIE TYD
2.21 op gevoel....	A - B - C - D - E	.... denkend	
2.22 oordink......	A - B - C - D - E	.... tree op	
2.23 betrokke.....	A - B - C - D - E	.... afsydig	
2.24 analities....	A - B - C - D - E	.... emosioneel	
2.25 intuïtief....	A - B - C - D - E	.... beredenerend	
2.26 versigtig....	A - B - C - D - E	.... emosioneel	
2.27 logies.......	A - B - C - D - E	.... sentimenteel	
2.28 aanvoeling..	A - B - C - D - E	.... beredenerend	
2.29 denkend......	A - B - C - D - E	.... instinktief	
2.30 op gevoel....	A - B - C - D - E	.... logies	
2.31 passief......	A - B - C - D - E	.... aktief	
2.32 doen.........	A - B - C - D - E	.... kyk toe	
2.33 beskou.......	A - B - C - D - E	.... voer uit	
2.34 beredeneerd..	A - B - C - D - E	.... gevoel	
2.35 oorweeg......	A - B - C - D - E	.... doen	
2.36 intellektueel	A - B - C - D - E	.... emosioneel	
2.37 nadenkend....	A - B - C - D - E	.... produktief	
2.38 evaluerend...	A - B - C - D - E	.... sensitief	
2.39 oplossend....	A - B - C - D - E	.... nadenkend	
2.40 beoefen......	A - B - C - D - E	.... beskou	

Dankie vir u bydrae tot hierdie navorsingsprojek. Wees asseblief verseker dat alle inligting as streng vertroulik beskou word. U identiteit sal op geen wyse openbaar gemaak word nie.

■ ■ ■

Appendix C

Reminder

4 September 1994

Dear Student

Approximately five weeks ago, a questionnaire regarding your learning style, was sent to you. Unfortunately I have not yet received your completed questionnaire.

Since each response is important for the ultimate aim of the research project, I would be grateful for your contribution in the form of the completed questionnaire.

As you may not have received the initial questionnaire, another questionnaire and addressed return envelope are included. Should your completed questionnaire be in the post, please accept my apologies for sending you another one.

Being a nurse myself, I am well aware of nurses' busy schedules and therefore want to express my special appreciation for the time spent to complete the questionnaire.

Thank you very much for your kindness.

Yours sincerely

G.H. van Rensburg

4 September 1994

Geagte student

Ongeveer vyf weke gelede is 'n vraelys met betrekking tot u
leerstyl aan u gestuur. Ek het ongelukkig nog nie u voltooide
vraelys ontvang nie.

Aangesien elke respons belangrik is vir die uiteindelike doel
van die navorsingsprojek, sal ek u bydrae in die vorm van die
voltooide vraelys opreg waardeer.

U het moontlik nie die oorspronklike vraelys ontvang nie. 'n
Tweede vraelys en gefrankeerde koevert word dus hierby
ingesluit. Indien u egter reeds u voltooide vraelys gepos het,
aanvaar hiermee my dank en ignoreer die skrywe asseblief.

As verpleegkundige is ek baie bewus van verpleegkundiges se
besige skedules en spreek daarom my spesiale waardering uit vir
u tyd en bydrae.

Baie dankie vir u vriendelikheid.

Die uwe

G.H. van Rensburg

Appendix D

Factor analysis of 40 items

of

Marshall and Merritt Learning Style Questionnaire

Table D. 1 Varimax rotated two-factor solution of items of the Learning
Style Questionnaire (N=40)

Item	Factor		Item	Factor	
	Factor 1	Factor 2		Factor 1	Factor 2
2.24	0.72	-0.02	2.25	-0.40	0.23
2.36	0.69	0.08	2.18	-0.43	0.24
2.29	0.67	0.16	2.14	-0.45	0.17
2.26	0.62	0.09	2.30	-0.51	0.25
2.27	0.61	0.02	2.8	0.02	0.70
2.17	0.55	-0.02	2.9	0.02	0.69
2.38	0.55	0.08	2.31	-0.70	0.66
2.15	0.53	0.14	2.2	0.07	0.64
2.34	0.51	0.03	2.35	0.11	0.62
2.23	0.35	-0.25	2.3	0.03	0.57
2.39	0.30	-0.10	2.33	0.11	0.57
2.19	0.26	-0.21	2.37	-0.05	0.57
2.40	0.25	-0.16	2.22	-0.01	0.51
2.16	0.20	-0.09	2.20	-0.05	0.42
2.13	-0.12	-0.02	2.21*	-0.31	0.34
2.1	-0.15	0.15	2.10	-0.18	0.26
2.12	-0.20	0.19	2.11	-0.04	-0.25
2.28	-0.24	0.21	2.7	0.08	-0.26
2.4	-0.33	0.32	2.32	0.15	-0.29
2.5	-0.37	0.28	2.6	0.10	-0.32

* Item excluded in the final analysis on theoretical grounds as it did

appear to belong to any of the two factors.